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Early in 1977, PLUARG began a program of public information and public consultation, leading to the establishment of 17 citizen panels. Each panel prepared and submitted a document to PLUARG presenting conclusions and recommendations for remedial measures to correct nonpoint source pollution problems in the Great Lakes Basin.

The nine United States reports were wholly written, reviewed and approved by each panel. They are the result of a series of three meetings of each panel held during the fall of 1977.

Each panel considered the PLUARG reference, major associated issues and possible remedial measures and identified remedial action most practical from a social, economic and environmental perspective.

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REFERENCE GROUP
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INTERNATIONAL
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PUBLIC CONSULTATION PANEL REPORTS - UNITED STATES

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REPORTS OF THE UNITED STATES PUBLIC CONSULTATION PANELS

TO THE POLLUTION FROM LAND USE ACTIVITIES REFERENCE GROUP

INTERNATIONAL JOINT COMMISSION
GREAT LAKES REGIONAL OFFICE
WINDSOR, ONTARIO

MARCH, 1978

1a

NOTICE

Statements, views and recommendations presented in this volume are totally those of the public consultation panels and do not necessarily reflect the views and policies of the Pollution From Land Use Activities Reference Group or the International Joint Commission.

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ACKNOWLEDGEMENTS

PLUARG expresses deep appreciation to the panelists, panel chairmen, and report writing committees who gave freely of their time and effort to produce the reports contained in this volume. The reports of the panels are very useful input to the decision making process of PLUARG.

The public consultation program in the United States was coordinated by Martin L. Clark. Excellent assistance, throughout the public information and public consultation programs, has been provided by Ms. Mary Vassov, Mrs. Deborah Egi and Mrs. Judith Ruthven.

PREFACE

The reports of the United States Public Consultation Panels have been reproduced with minimal editing. There has been no editing of content or meaning. Some minor editing was done to conform with International Joint Commission publication policy.

These reports were wholly written, reviewed and approved by each panel. They are the result of a series of three meetings of each panel held during the fall of 1977. The reports reflect the hard work, dedication, and genuine concern of the panelists to meet their Panelist Statement of Work listed below.

1. The panel will consider the Pollution From Land Use Activities Reference Group (PLUARG) reference, major associated issues and possible remedial measures.
2. The panel will identify for PLUARG remedial action most practical from a social, economic and environmental perspective.
3. Each panelist will attend three meetings, necessary travel costs of panelists will be covered by PLUARG.
4. To the extent possible, panelists will interact with members of the groups which the panelists represent, and other groups and elicit responses.
5. At its first meeting, the panel will elect a chairman to conduct meetings and provide continuity. PLUARG staff will provide support services to keep necessary records on participation and views expressed.
6. Panelists will have access to all available reports and to PLUARG resource people.
7. Each panel will present to PLUARG, a written report by January 15, 1978 stating concerns, findings and the panels' recommendations to PLUARG on remedial measures. If there is general agreement on an issue, or general polarization, this should be noted in the report. The panel is not required to come to consensus on any issue.
8. Each panelist will be asked to evaluate the advisory panel process.
9. Findings and recommendations stated in the panel reports to PLUARG (See 7) will be published as one volume of the PLUARG technical report series and made available for general distribution.

BACKGROUND

PLUARG was established by the governments of the United States and Canada through a reference to the International Joint Commission under the Great Lakes Water Quality Agreement of 1972. The PLUARG reference deals with non-point source pollution and its effect on Great Lakes Water Quality.

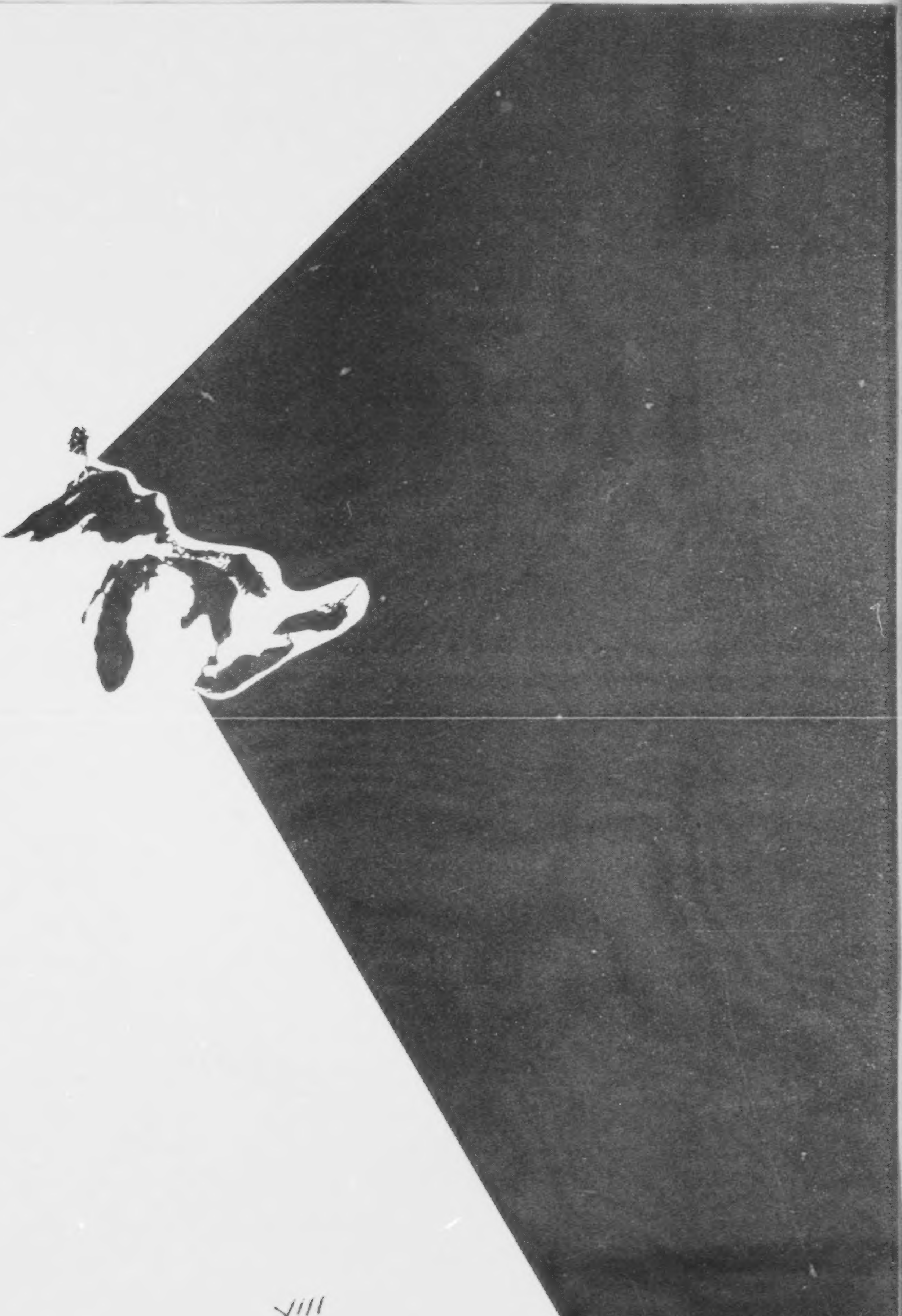
Specifically, PLUARG was charged with three questions:

1. Are the boundary waters of the Great Lakes System being polluted by land drainage (including ground and surface runoff and sediments) from agriculture, forestry, urban and industrial land development, recreational and park land development, utility and transportation systems and natural sources?
2. If the answer to the foregoing question is in the affirmative, to what extent, by what causes, and in what localities is the pollution taking place?
3. If the Commission should find that pollution of the character just referred to is taking place, what remedial measures would, in its judgement, be most practicable and what would be the probable cost thereof?

PLUARG membership includes nine United States members and nine Canadian members.

Early in 1977, PLUARG began a program of public information and public consultation, leading to the establishment of citizen panels in each of the states bordering the Great Lakes and throughout the Province of Ontario.

PLUARG's public consultation program marks the first time that public input has been sought prior to the completion of a reference group report to the IJC.



REPORT OF THE
ILLINOIS
PANEL

January, 1978

A-I

WORK PLAN OF PANEL

During the first meeting of the Chicago PLUARG Public Participation panel, the group broke into two groups to develop prioritized lists of the nonpoint problems evident in the Great Lakes area.

The first group had two categories within which items were prioritized. They were the basic problems in a land use activity category and also in a management category. They were as follows:

LAND USE ACTIVITIES

1) Agricultural Land & Chemical Runoff
2) Urban Storm Runoff
3) Erosion & Sedimentation - riverbank, shoreline
4) Air Pollution - atmospheric fallout
5) Solid & Liquid Waste Disposal

MANAGEMENT PROBLEMS

1) Inter-governmental Cooperation
2) Pollution Enforcement in Relation to Economic Growth
3) Water Quality & Supply
4) Determination of "Pollution"
5) Economy in Solution of Pollution Problems

The second group had three categories within which items were prioritized. These were Water Quality Characteristics, Sources and Remedies. They were as follows:

WATER QUALITY CHARACTERISTICS

1) Toxic Substances
2) Nutrients
3) Drinking Water/Public Health
4) Long-term Effects
5) Thermal

SOURCES

1) Growth/Urban/Agricultural/Recreational
2) Waste Disposal
3) Shoreline Erosion
4) Loss of Wetlands
5) Atmosphere

REMEDIES

1) Regulation of Nonpoint Sources
2) Elimination of Conflicts and Fragmentation
3) Basin-wide Water Quality Management Institution
4) Willingness/Ability to Pay
5) Economics (tied with) Communications

The second meeting of the Chicago citizens' panel involved some analysis of the various PLUARG information papers which had been made available. The panel came to two conclusions mid-way in this meeting:

a) We agreed that the problems of eutrophication and toxic substances were undoubtedly the most serious concerns affecting the Great Lakes today.

b) The panel's viewpoint was that of residents of an urban area. With the notable exception of stormwater runoff, the problems of nonpoint pollution in the Chicago area appeared relatively slight compared to the immense burden of the known "point" discharges.

As a result of the ramifications evident in the second point, above, the panel agreed it would prefer addressing the PLUARG group on topics of a more general nature, all dealing in one way or another with the Great Lakes. Individual members chose topics of their own liking, and agreed to have their papers ready by the next meeting.

The third meeting of the Chicago citizens panel involved analysis of the group's progress on various topics. It was decided to leave the writing intact, as expressed by the authors, and to have the panel comment as a whole on each topic.

A final follow-up meeting was held to provide assurance that the thoughts expressed by the panelists were satisfactory to the authors, and that the panel comments indeed reflected the thinking of the entire group. As a closing task, the panel drew from the individual papers, as well as the group discussions, certain points with which the entire panel could agree. These are outlined as follows:

THE CHICAGO AREA PUBLIC CONSULTATION PANEL AGREES THAT:

1. Residents of the Great Lakes Basin share a natural legacy unique in all of the world. The quality of the waters of the Great Lakes should be restored, enhanced and protected to the utmost of our ability.

2. There is a need for some governmental agency to act in an overall policy making capacity for the Great Lakes Region. Other governmental entities could work more effectively and could coordinate their actions within such a policy framework.

3. Significant progress in pollution control would occur if/when full funding for control mechanisms and authorities were forthcoming.

4. Most of the administrative problems encountered in dealing with nonpoint pollution could be handled with existing regulatory agencies and organizations. We see no need to create additional authorities.

5. Cooperative efforts among regulatory agencies and authorities should be strongly encouraged. Similarly, cooperative efforts between governmental groups and interested citizens should be continued and encouraged. (Note: Panel specifically noted the combined efforts of the Metropolitan Sanitary District and the Soil Conservation Service in development of the Chicago area floodwater management plan, and the involvement of local citizens in "208" area planning.)

6. Currently existing forms of land use control, such as erosion and sedimentation ordinances, flood plain ordinances, and the remedial measures described by PLUARG, provide an important means for limiting pollution from nonpoint sources.

7. Much additional effort needs to be placed in education of the citizens of the area about the Great Lakes and their special needs and problems. There cannot be too much emphasis placed on this objective.

8. Illinois should be granted an increase in the amount of water diverted from Lake Michigan, based on the contingency that water conservation efforts be required from all participating communities and users. Continued reliance on poor quality underground wells for drinking water purposes is a risky proposition.

9. The continued use of recycled water and treated effluent must become an accepted practice in the Illinois area.

10. The use of non-structural means of controlling runoff should be encouraged wherever and whenever possible. All remedial measures should be considered with a view to the costs as well as the benefits.

11. The loss of prime agricultural land to the developer is a serious cause of concern to society. This is a special problem that can be best addressed by innovative tax policies, special zoning districts, purchase of development rights, etc.

The following individual comments were submitted by the Chicago Public Participation panel and were made available to PLUARG members.

1. "If I Had Just One..." - Mary Lee Strang
2. "Classifying Remedial Measures for Pollution Abatement" - Dr. Elizabeth Warren
3. "Land Use Controls" - Gordon Goodman
4. "Solids and Waste Management" - Joanne H. Alter
5. "Drinking Water/Sewage" - Kathy Schuck
6. "Who Shall Pay for Ecological Improvements?" - Ray O'Malley
7. "To Grow or Not to Grow" - Jack Schmidling
8. "Education" - Joan Westfall, Ray Oltmanns, Laurence Charlton
9. "Philosophy of Remedial Measures" - Charles C. Isely
10. "Examples of Using Nature's Way" - Lane Kendig
11. "Some Agricultural Solutions" - Art Mier

UNITED STATES PUBLIC PARTICIPATION PANEL MEMBERS AND AFFILIATIONS

ILLINOIS

NAME	AFFILIATION
Joanne H. Alter	Commissioner, Metropolitan Sanitary District of Greater Chicago
George G. Carpenter	Toxicologist
Laurence Charlton	Illinois Wildlife Federation
Michael Freeborn	Attorney
Dona P. Gerson	Aide to Commission Alter (MSD)
Gordon L. Goodman	Great Lakes Tomorrow
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Greg Knowles	Assistant to Village Manager, Winnetka
Art Mier	Dynamics Corporation of America
Ray O'Malley	United Steelworkers of America
Adele Neems	Alderwomen, City of Evanston
Jack Schmidling	Salmon Unlimited
Kathy Schuck	President, Lake Michigan Federation
Mary Lee Strang	Panel Chairman, League of Women Voters, ILL.
Robert B. Teska	Planning Consultant
Dr. Elizabeth Warren	Village Official, Glencoe
Joan Westfall	Realtor
Jack B. Williams	Illinois State Representative
Ray Oltmanns	Illinois Wildlife Federation

LIST OF APPENDICES

A. "The Small Watershed Study"
"Storm Water Management"

Department of Planning, Zoning & Environmental Quality - Lake County, Illinois (Examples of non-structural controls useful in suburban areas; "Working with Nature.")

B. "How to Bottle Rainstorms"

The Metropolitan Sanitary District of Greater Chicago
(Explanation of TARP program under way in portions of MSD.)

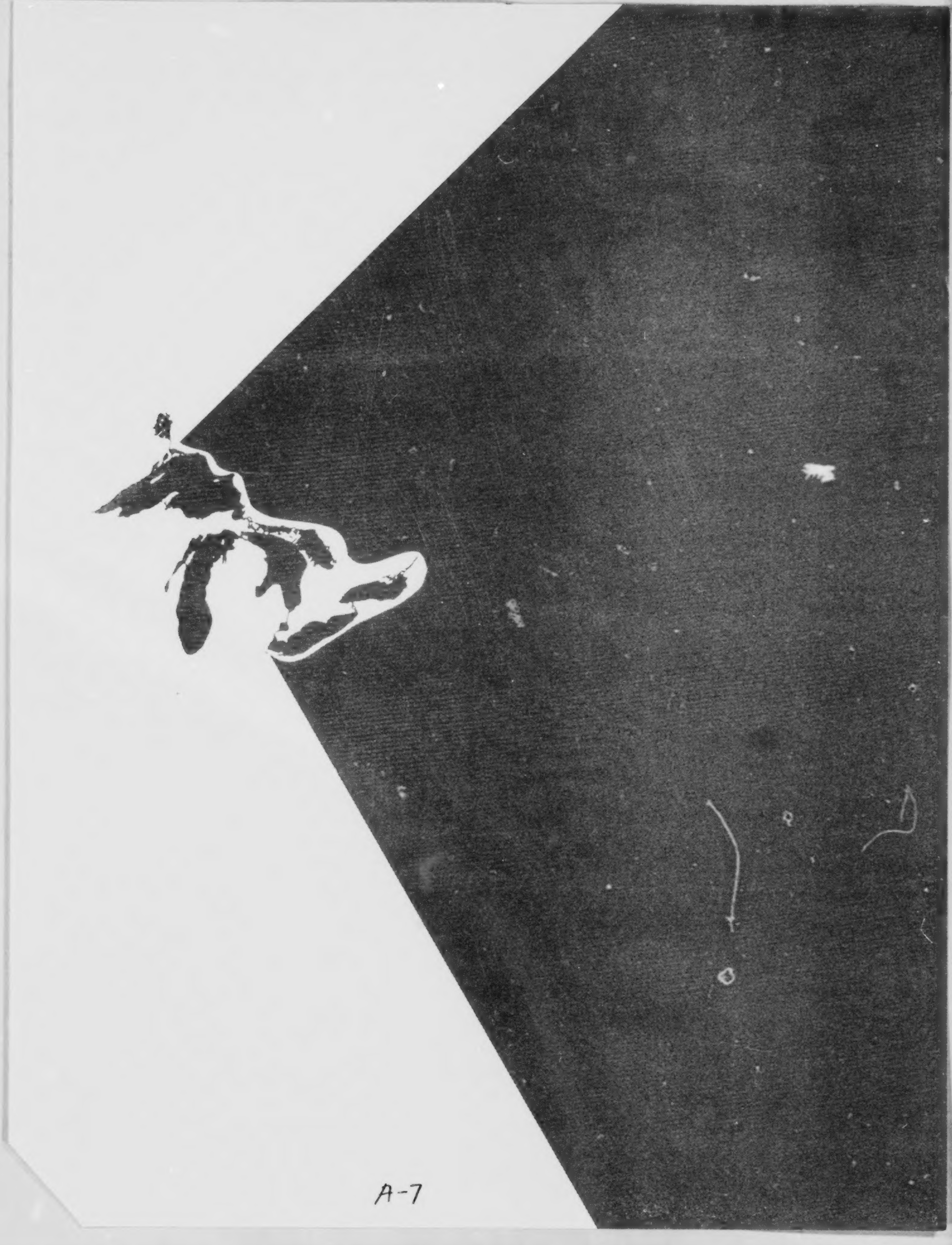
C. "Our Community and Flooding"

U.S. Department of Agriculture - Soil Conservation Service and
Metropolitan Sanitary District of Greater Chicago
(Examples of inter-agency cooperation.)

D. Articles from local journals of a type that is becoming common throughout the Middle West.

Programs and literature from state and federal agencies that are available.

(Several examples of information available to farmers in the Middle West.)



A-7

REPORT OF THE
INDIANA
PANEL

January, 1978

B-I

INTRODUCTION

The Indiana panel met on four occasions during October, November and December, 1977 in South Bend and Gary. We listened to presentations by PLUARG staff and the Indiana representative to PLUARG and then organized ourselves into subcommittees to consider specific non-point source pollution impacts on the Great Lakes. Eight problem areas were considered by these subcommittees, and statements, based on our collective reviews of PLUARG Reference Group's discussion papers and our own knowledge, have been prepared, discussed and revised by the panel at large and are presented below. These statements comprise the major portion of this report.

Comments by some panelists and/or the organizations they are associated with, were submitted as individual statements of particular concern. Some of these comments may be forwarded under separate cover to the Reference Group.

STATEMENT OF PANEL CONSENSUS TO PLUARG

There was strong sentiment expressed by the group that the southern end of Lake Michigan is a unique area within the Great Lakes Basin due to the environmental features and the unusual concentration of steel, oil and related industries, transportation and other intensely urban land uses which make it one of the largest urban/industrial complexes in the nation. As such, serious doubt was expressed concerning the reliability of extrapolating water quality data from other industrial regions to provide an accurate representation of the nature and extent of pollution problems in this portion of the basin. Since this region is believed to have a major impact on the entire Great Lakes Basin, it is recommended that serious consideration be given to initiating needed water quality studies at the southern end of Lake Michigan for the purpose of identifying and quantifying specific nonpoint pollution sources unique to this region. Since "208" Planning is currently being implemented, useful data from that source should be obtained and supplemented by additional studies to the extent necessary in achieving the goals of PLUARG.

As stated above, the Indiana Public Consultation panel is quite disturbed by some of the Reference Group's conclusions concerning nonpoint source pollution in the southern Lake Michigan Basin based on extrapolated data. We wonder if this results from more extensive efforts on the part of Canada to collect the necessary data or possibly from the fact that Lake Michigan is wholly within the boundaries of the United States and, therefore, is of a lesser concern to the IJC? This panel believes that the IJC has only two reasonable choices in this matter: 1) begin extensive studies in the Lake Michigan Basin under IJC auspices; or 2) coordinate its research efforts much more closely with other agencies to accomplish the needed studies in order to make conclusions and public policy recommendations. A third option, of course, would be for the IJC not to consider the problems of Lake Michigan, leaving these concerns for other agencies to consider, such as the Great Lakes Basin Commission. However, we do not recommend this latter course of action.

COMBINED SEWER OVERFLOW AND URBAN RUNOFF

It is agreed from the PLUARG position paper on urban land uses that the relatively impervious nature of these areas and the high intensity of human activities leads to the high concentration of phosphorus, metals and other contaminants normally associated with urban area loadings. The problems of controlling the transport of these pollutants into the waters of the Great Lakes Basin in a practical and economically feasible manner are extremely complex. Planning under the Water Pollution Control Act Amendments of 1972, which specifically addresses this problem, is mandated by the Environmental Protection Agency's Program Requirement Memorandum No. 75-34, entitled "Grants for Treatment and Control of Combined Sewer Overflow and Stormwater Discharges". PRM 75-34 essentially indicates the necessity of two rather distinct studies upon which effective facilities planning can be developed for a specific area. The first is a surface water flow and quality modeling study projected through a 20-year planning period to define the "level of pollution control...necessary to protect a beneficial use of the receiving stream". The second is a study to define the characteristics of combined sewer overflow and stormwater discharges such as quality, quantity, duration and flow, plus an evaluation of "alternative techniques which might be utilized to attain various levels of pollution control" for a 20-year planning period. Where the results of these two studies interact, the benefits to receiving waters are evaluated for a range of pollution control levels and costs.

The water quality modeling study related to the above and the subsequently derived data are subject to influence from several pollution factors including: 1) point and non-point sources both upstream and downstream of a particular planning area, 2) regionally planned and coordinated pollution abatement strategies, and 3) water quality projections considering these variables plus wet weather conditions. As such, the responsibility for deriving this information lies most appropriately with Indiana under Section 303 Basin Planning and with the regional 208 areawide waste management planning agencies, both of which have received substantial, but in many cases inadequate, planning funds from the Environmental Protection Agency for this purpose, and have not as yet produced the necessary data.

At the present time, many communities are being required by Indiana and the Environmental Protection Agency to commence planning for the control of combined sewer overflow and stormwater discharges. In most cases the necessary water quality data are either totally lacking or substantially insufficient. Planning of this kind is at best a poor effort, but beyond that will more than likely result in either an inefficient use of limited construction funds or a facility which will not adequately control the urban combined sewer overflow and stormwater discharge problem.

In the interest of obtaining the maximum benefit from pollution control expenditures of this nature in the Great Lakes Basin, it is recommended that two-step planning process be implemented to ensure effective planning. This would involve the following basic steps:

1. Define the local problems and determine if and where the water quality data base is adequate.

2. Where it is not, make specific recommendations identifying what data are necessary and that 303 and 208 agencies give priority in obtaining such data in the Great Lakes Basin.

A moratorium should be placed on all such proposed planning projects which would attempt to proceed in the absence of adequate water quality modeling data. Furthermore, the modeling which would provide the necessary data base for these Great Lakes Basin projects should be given top priority within the Section 303 and 208 planning efforts. Where these efforts are lacking in sufficient scope or depth, special supplementary funding should be provided as necessary to ensure that adequate water quality modeling data are available for planning the control of combined sewer overflow and stormwater discharges. Only when these adequate data are made available, should the combined sewer overflow planning processes be completed.

Reaction to Remedial Philosophy Questions

1. Should measures be equally administered throughout the Great Lakes Basin?

   Yes, to the extent that certain minimum standards of water quality should be maintained. This may require a great expenditure for facilities in one community as opposed to a minor expenditure in another, but this is primarily a function of a community's relative adverse impact on the receiving stream.

2. Who should pay the cost for remedial programs?

   As it is currently set up under PL 92-500, the cost is shared by the federal, state and local governments. This method of cost-sharing is believed appropriate.

3. Which level or levels of government should be responsible for implementing remedial programs?

   Implementation responsibility should be at the local level; however, planning must be shared by federal, state, regional and local entities.

4. Can measures be voluntary or is enforcement necessary?

   If current problems are to be solved, it is believed that enforcement is necessary; however, for future development, control of urban runoff pollution should be designed into the project planning by appropriate zoning, building codes, and performance bonds.

RUNOFF FROM AGRICULTURAL LANDS

Reaction to Remedial Philosophy Questions

1. Should measures be equally administered throughout the Great Lakes Basin?

   We do not feel it would be necessary or desirable to treat all agricultural lands equally. Only those lands that have severe erosion contributing sediment and other pollutants in the water need to be treated. In terms of water quality the amount of erosion that occurs on the land should not be a factor. Only that erosion and sediment from the lands which stays with the water and moves into the streams and eventually into the lakes should be considered for control. In this way the priorities will be identified (by the 208 agency) and maximum benefit/cost can be achieved.

2. Who should pay the costs for remedial programs?

   Since most of the benefits coming from reduced amounts of pollutants in the water are to the general public, then the general public should bear a major portion of the costs of these remedial programs. Landowners should be expected to pay for those soil erosion practices to the degree that they maintain soil productivity at some reasonable level. Costs to install management practices to reduce soil erosion in many cases do not lead to increased income or productivity of the individual landowner. The public, who benefits from reduced water pollution, should continue to share the cost of these remedial programs.

3. Which level or levels of government should be responsible for implementing remedial programs?

   A county or local level of government would be most desirable to implement these programs on agricultural land. Proper education, incentives and cost sharing programs using state or federal funds, together with those regulatory programs developed and administered by the state would be used to make those who would not do so through normal education and incentive programs comply.

4. Can measures be voluntary or is enforcement necessary?

   An effort to stimulate voluntary compliance should be an integral part of any enforcement program. Enforcement, however, will probably be necessary to reach compliance.

SHORELINE LANDFILLING

Reaction to Remedial Philosophy Questions

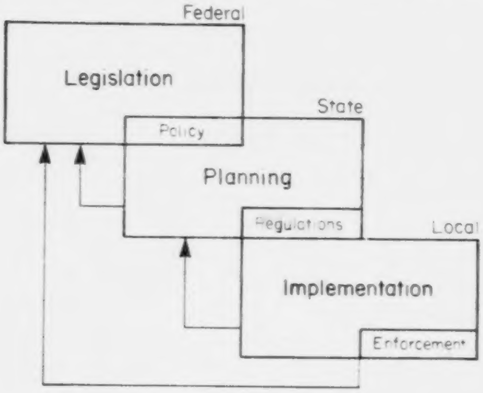
1. Should measures be equally administered throughout the Great Lakes Basin?

   A standard for environmental quality should be determined (if it does not already exist) and measures for remediation should be administered so as to achieve this standard. Since lake and lakeshore systems are heterogeneous in nature, a single set of absolute measures seems to be unwise; however, a single set of environmental quality standards is necessary.

2. Who should pay for remedial measures?

   The public, of course, pays the costs either directly or indirectly. Thus, a more significant question is what should be the mixture of direct and indirect costs to the public? Public and private sectors should share the direct costs. A system of incentives and disincentives seems desirable. The costs of necessary research to set landfill standards and requirements should be a direct public cost. A true value for reclaimed land is significant in assessing costs and benefits of "proper" landfilling.

3. What roles should the various levels of government play in landfilling?



   All three levels of government must be involved; federal for legislation-policy-funding; state for planning and regulations; and local for implementation and monitoring.

   Obviously, feedback mechanisms and provisions are necessary. In short, all levels of government must be involved in order to have a successful program.

   The Indiana panel believes that the state level should be preeminent. Indeed, the State of Indiana should have a local monitoring and enforcement presence, i.e., the State government should have a permanent physical presence in the Indiana Coastal Zone.

4. Is enforcement necessary?

   Past practice would seem to favor enforcement as a basic element in any remedial program. This position is supported by the records of successful environmental problem remediation where enforcement is an available tool as opposed to the less successful record where only voluntary compliance is possible.

GENERAL COMMENTS ON THE SHORELINE LANDFILLING PAPER

1. Separating the discussion on environmental quality impacts of landfills from associated harbor breakwaters and jetties seems unwise. Indeed, at the Port of Indiana, they are integrated into a singular construction project. There, related impacts include not only water quality but more importantly, shoreline erosion, sediment transfer and sediment deposition, a critical concern in a lake system with fluctuating water levels. The Indiana panel disagrees with the PLUARG decision not to consider deep water disposal of dredge material and harbor breakwaters as landfilling.

2. Landfilling at Toronto in Lake Ontario is cited as the source of data for analysis and interpretation for general concerns affecting the entire Great Lakes System. Is this wise? The dynamics of natural and human-modified lake processes may well differ in several of the Great Lakes. What seems most apparent is the lack of adequate data of geologic, hydrologic and limnologic nature necessary to make many of the conclusions in this paper. The Indiana panel disagrees with the PLUARG concentration on Toronto landfilling. This fails to consider industrial landfilling in the Calumet Region and all the effects on Lake Michigan water quality. The U.S. Army Corps of Engineers' approach has been piecemeal when a broad integrated and intensive data gathering and analysis program is imperative. Data on currents, shoreline processes, sediment erosion, transfer and deposition, and limnologic conditions are needed for each basin and should be a primary activity embarked upon now.

3. The statement: "Although the effect of this landfill material (slag) on lake water quality has not been extensively investigated, it is anticipated that the effects are not serious." The accuracy of this statement is doubted by several of the panel members concerned with effects of industrial landfills in the Indiana coastal zone.

4. In point III of the report regarding disposal of deep water dredge materials in diked disposal areas, are "perceived to be negligible, however, on-site investigations to substantiate this conclusion are limited." If the results of the international dredging study mentioned on the next page are indeed available, why not consider them? The committee feels this is an important area that requires deeper consideration.

5. The committee concludes that the Calumet Region's lakeshore contains very extensive industrial landfills and deserves additional study. The committee questions how conclusions can be drawn when lack of information is freely admitted.

6. The type of shoreline landfilling and the quality of the materials used in these operations require close monitoring and precise regulation.

LANDFILLING TYPES

1. The conclusion concerning only an interim turbidity problem of type I landfilling (residential/recreational) seems premature. The studies recommended for the Chicago Lakefront Plan (Gemmel, Armstrong, Meltzer and Reshkin) would appear to require more study before such a conclusion. Certainly this type of landfill has the least negative impact on a relative scale than the other two types. The concerns expressed for wetlands (where present) and interruptions of natural shoreline current and sediment processes by type I landfilling are valid and concurred with.

2. At the south end of Lake Michigan, landfilling for industrial purposes has become common. It is difficult to reconcile the conclusion on page 4, that effects of total dissolved solids, high pH, mercury, lead and metals are not serious, with the federal concern in the United States over toxic substances, their identification, concentration and environmental effects. Indeed, the conclusion may be ludicrous in light of our meager knowledge concerning these substances.

3. Type III landfilling of dredge spoil occurs in Indiana. Again, the conclusion on page 4 of negligible impacts on water quality is perceived as premature and presumptuous.

4. Commercial and industrial landfills, harbor structures, and other human modifications of the shoreline are extensive at the south end of Lake Michigan. Direct study of the area is needed to determine whether any further landfilling should be allowed.

SUMMARY

1. In Chicago-Northwest Indiana, landfilling of the past and proposed for the future is extensive; it is a major environmental quality concern.

2. The conclusions of the paper seem premature and presume knowledge which does not exist.

3. Detailed field and laboratory study is imperative before any conclusions can be considered.

TOXIC SUBSTANCES

Criteria: Substances must be toxic to fish, man or wildlife, or be a mutagen, carcinogen or teratogen.
Substances must be persistent.
Evidence of bio-accumulation.
Substances must be identified in any of the biota, rainwater, effluents, benthos, sediments, etc.

The quantity of many organic compounds dissolved in water may be negligible; however, these same compounds are found in alarming levels in fish, plankton, or sediments. This is true of PCBs, for example.

From 1943 to 1970, the production of organic compounds rose from 5 billion kilos to 69 billion kilos. There are 300 to 500 new chemicals produced annually whose toxicity is unknown and difficult to determine. The synergistic effects are also unknown.

The construction of nuclear power plants on the shores of the Great Lakes presents another major hazard. Nineteen such plants have been proposed for the periphery of Lake Michigan; some are presently in operation. Radioactive material can pose a threat to human and aquatic life. This subject was not mentioned in the Environmental Health Issues document.

The report does state the urgency of minimizing the entry of organic compounds into the environment. The ban on the use of DDT and the resulting reduction of that compound in Lake Ontario sediments is encouraging. However, there is some evidence that PCBs have been mistakenly identified as DDT, which explains, to a partial degree, the increase of PCBs in the Great Lakes Basin. (Please see Table 1, page 3 of the Environmental Health Issues.)

Heavy Metals (Lead, Mercury, Arsenic, Cadmium, Selenium, Copper, Zinc, Chromium and Vanadium) are considered a health hazard if there is a potential for biological transformation to a methylated form, and if there is enrichment of sediments and organisms with these metals.

Water quality objectives have been established for total metal concentrations in the Great Lakes, but the objectives do not consider the methyl form of a metal. They may occur in low concentrations, but they bioaccumulate. "This could signify a serious problem with lead, a potential time bomb." (Quote from Environmental Health Issues).

Lead levels in Lake Erie and Lake Ontario are substantial from diffuse sources: 69% rivers, 21% air pollution for Lake Ontario and 66.7% air pollution, 17% rivers, 13% erosion for Lake Erie.

Table 17, page 29 lists heavy metal content of liquid sludge from municipalities in four states and Ontario. These contain the first figures on Lake Michigan sources. The levels for Indiana are the highest for almost every metal and significantly higher for lead. This underscores the vital need to study the south end of Lake Michigan. This is a serious omission.

The large concentrations of heavy metals in municipal sludge are a result of industrial effluent being handled by municipal treatment plants which are not equipped or skilled in treating, neutralizing or disposing of these substances. At times of overflow, this material is dumped into the lakes with no treatment whatever.

Conclusions: The threat to human health and the aquatic ecosystem of the Great Lakes Basin is of such mammoth proportions that some very drastic steps need to be taken.

1. It is a serious mistake to use information from studies of Lake Ontario to make assumptions about Lake Michigan. It is imperative that an intensive investigative report be made about the situation at the southern end of Lake Michigan. Inputs here from industrial, urban and municipal sources are horrendous and vastly underestimated.

2. The Clean Water Act of 1972 states as a goal a 1985 date for reduced discharge of pollutants from all sources into public waters such that waters are fishable and swimmable. That date may be unrealistic, but the goal is not; it is an urgent necessity. It should be mandatory for all industries to be responsible for re-cycling their own wastes, recovering, neutralizing or whatever in a completely closed system. Research monies should be made available from joint industry - state - federal sources and subsidies given, if necessary, to accomplish this purpose. Industrial wastes should not often be treated by municipalities or dumped summarily into landfills.

3. The closed system or zero discharge goal should be extended to air pollution sources as well. Enforcement of air pollution regulations in the Porter County, Indiana - Chicago area is seemingly ineffective. This is one of the largest industrial areas in the nation. Air pollutants are major contributors to deteriorating water quality in the Great Lakes Basin. Lead levels in Lake Erie are 66.7% from air sources (PLUARG figures).

4. Federal toxic substances legislation is inadequate to meet the problem. Stringent legislation should be formulated here and in Canada mandating industries to prove that new chemicals introduced are harmless to man and the environment. The responsibility should rest with the producer to provide such hard evidence. Synergistic effects should be considered. When doubt exists about the nature of a substance, it should not be permitted to be used.

5. Transportation, mainly associated with highways, is another source of heavy metals and other toxic hazardous substances. Runoff from roads (see page 2, Table 1, Transportation Paper) is a considerable source. More extensive use of railroads to move both people and products seems to offer fewer negative environmental impacts.

6. Leachate from sanitary landfills is another source of toxic materials. More careful site selection for landfills, such as areas geologically sound with impervious bases should be chosen. Vaporization of PCBs from landfills as well as leaching is a hazard.

7. Some basic changes in the way in which we live may be essential: conservation of natural resources, recycling and recovery, a slower growth rate, a more careful and selective use of new technologies. Every new "advance" should be questioned in terms of its environmental effects as well as its benefits. Mandatory recycling legislation for paper, cans and bottles should be passed federally. Several states with such legislation have found it to be very successful in terms of reducing solid waste and litter. The more subtle effects are to raise the public consciousness and concern about the limited nature of our resources and the more careful husbanding of them. Public recognition of the problem is required before effective action can be taken. But it is the purpose of responsible government to be aware of those problems - not only for this generation of citizens - but for future generations, and to educate the public to the dangers involved in pursuing our present heedless course of wastefulness, carelessness and irresponsibility concerning the environmental consequences of what we do to our air and water.

Reaction to Remedial Philosophy Questions as Posed by PLUARG

1. Should measures be equally administered throughout the Great Lakes Basin? (e.g.: should distance from the lake, soil type, amount of rainfall, etc. affect implementation of remedial measures)

   In order to control toxic and hazardous substances, many of which cause problems in minute concentrations, it is necessary that control measures be uniformly administered throughout the basin.

2. Who should pay the costs for remedial programs?

   If the toxic and hazardous substances can be pinpointed to a specific source, the cost necessary for preventing the substance from entering the environment should be borne by the responsible party. In many cases it may be necessary to prohibit the manufacture of a toxic substance. If the source is general, such as a substance that has accumulated over a long period of time, as in river bottom sludges, the cost of remedial measures may have to be borne by government.

3. Which level of government should be responsible for implementing remedial programs?

   All levels of government must be responsible for implementing remedial programs. The overall policy and general surveillance of program effectiveness should be at the federal level. The state government and in some cases the local government should be responsible for day-to-day implementation.

4. Can measures by voluntary, or is enforcement necessary?

   Control measures cannot be voluntary and enforcement is necessary. Of course, there should be a program to encourage voluntary compliance and make the public aware of the problem as well.

ATMOSPHERIC LOADINGS TO THE GREAT LAKES

We are glad the PLUARG has made a necessary start by including atmospheric loadings to the Great Lakes. Too often air is separated from water and land use in spite of continuous mixing. Atmospheric loadings originating at the southern end of Lake Michigan probably affect water quality in the entire Great Lakes Basin more directly and rapidly than many direct water pollutant discharges.

Although parameters are listed, they are not related to the effect on human health, and the list itself is far from complete. Might we suggest a concentrated study on parameters, synergistic effect, trade-offs, i.e., where air is scrubbed but water is contaminated, etc? The southern tip of Lake Michigan with its conglomerate of steel, petroleum, chemical industries, urban centers, traffic routes and energy generation, would make an excellent laboratory.

Further research is indicated but we are concerned about the gap in information. Why are the governmental and private sectors moving so slowly when distress signals have been posted for the last decade? Even before the fishermen found out about PCBs, the problems of atmospheric lead, phenol and ammonia vapors from the coke operations, sulfuric acid, hydrocarbons filled local newsletters over a period of time.

There is a great deal of citizen concern as well as confusion due to the apparent lack of knowledge involving atmospheric loadings. Perhaps Margaret Mead is right when she points out that we are stingy when spending resources for research. To quote her recent remark "When you're spending millions for death, why not millions for life?" A large commitment of both talent and time is also needed immediately. We must coordinate all available research data and accelerate testing and research to fill the gaps at all levels so that realistic human costs can be assessed.

CHANNELS AND HARBORS

Except for the Port of Indiana, harbors are the receivers of non-point source pollution from their drainage basins. Additionally, point source pollution results from some harbor facilities and/or processes. Often it is difficult to distinguish point source from non-point source pollution in this environment. Thus, the panel considers harbors and channels leading to them to be non-point source environmental problems in Lake Michigan. Additionally, the effects which harbor structures have on shoreline erosion, sediment transfer and deposition result in non-point source pollution.

The panel consensus is that the U.S. Army Corps of Engineers has historically placed a higher priority on commerce and nagivation than on environmental quality. The policies resulting in these priorities need revision towards a better compromise between environmental quality and commercial navigation. At the south end of Lake Michigan, the panel recommends an upgrading of the operations at harbors to reduce pollution.

Of major concern to the panel are the Little and Grand Calumet river channels. The standards for water quality proposed by the state are considered too lenient by the environmental groups and too difficult to meet by the industrial and utility interests. So significant was this issue that the panel did not have time to fully consider it, nor were we able to reach a consensus for recommendations to PLUARG other than that the problem is worthy of pilot project study by PLUARG.

Bottom sludge,channel and harbor sediments in most Indiana ports require immediate dredging. Such dredging and disposal of dredge material, especially in shoreline landfills, should be an integral part of any consideration of Indiana harbors and channels with particular attention paid to toxic substances and non-point source pollution effects on Lake Michigan. Wetlands have been sites of land disposal and few remain in Indiana's coastal zone. The environmental quality of these remaining wetlands is integral to the problem.

EUTROPHICATION IN THE GREAT LAKES

The discussion paper covers the topic well and is farily comprehensive. On page 21, we would appreciate population growth figures for the periphery of Lake Michigan as well.

No mention is made of the effect of heated effluent. We do not think the recommendations for remedial measures are stringent enough in the United States. Whereas Canada as a whole is reducing phosphates in detergents (though not to a sufficient degree - it should be zero), only some of the Great Lakes states are doing so. Meanwhile, tributaries are carrying phosphorus from detergents to the Great Lakes. The ban on phosphates in detergents should be nationwide and total, here and in Canada.

Tertiary treatment for sewage is important, but in view of the vastly escalating populations in the Great Lakes Basin, closed systems may need to be the goal. The Water Quality Act of 1972 set a 1983 date for goal attainment. That goal should be met sometime in the 1980's. Meanwhile, all sewage effluent should meet strict phosphorus standards.

Careful monitoring of land disposal of treated sewage effluent will be one approach. Use of package sewage treatment plants, *clivus multrum*, and a variety of other innovative methods should be explored and applied if they are found to be successful. Meanwhile, it is vital to immediately halt the overflow from combined sanitary and storm sewers. That is a major problem in this area.

Apparently this is a short version of the data and information collected for this study. It is readable and easily understood and seems to be mostly a summing up of the results of conditions found rather than a delineation of the sources of pollutants.

At our first Indiana meeting, the panel asked why the map of Lake Erie given to us showed only eutrophic conditions on the Canadian side. We were told there was no information available on the United States side of Lake Erie for these conditions. This was a shocking neglect in the cooperative efforts that should be expected from the United States.

In the studies given to us very little was said about the results of thermal additives. The study recently received on "Conservation Districts and 208 Water Quality Management" does not touch on the problem. Perhaps this is considered a "point source"; however, the thermal effect on nutrients would accelerate eutrophication and cannot be underestimated. It should be given considerable study.

As to phosphorus from agriculture runoffs, atmospheric loadings along with non-sewered conditions, detergents and industry, it would seem a good portion of this could be traced and controlled or managed. Emphasis should be placed on programs to improve agricultural methods related to fertilizer runoff.

It is with regret that we note that the United States House-Senate conferees in their recent agreement on a new set of goals on the original 1972 Clean Water Act, chose to drop the Senate-passed provision restricting the use of phosphate in detergents sold in states bordering the Great Lakes. The League of Women Voters had taken a position in support of this provision.

EVALUATIVE COMMENTS

The Indiana Public Consultation panel commends the International Joint Commission and PLUARG for these initial efforts to seek public input into their deliberations. This is a beginning; however, it should not be considered as anything more than a bare beginning. In hindsight it is easy to say that public participation should have occured during the forumlation of the policy and/or study documents of the Reference Group. The panel was not given sufficient time to assimilate the data and conclusions and, more importantly, to interact with the researchers and policy formulators.

The trend in public participation in environmental affairs is quite clear in the United States. Both the 1972 Amendments to the Federal Water Pollution Control Act (PL 92-500) and the Resource Recovery Act of 1976 clearly spell out what public participation will be. The International Joint Commission faces the same public concern problems as 208 water quality planning agencies: How do we reach those publics which do not perceive their "stake" in the environmental quality of the Great Lakes? This may be an impossible task, but an extensive effort of education and creating access to the public process is warranted. Additionally, 208, CZM, and other organized efforts have created public constituencies. PLUARG should use these existing constituencies as well as creating its own.

UNITED STATES PUBLIC PARTICIPATION PANEL MEMBERS AND AFFILIATIONS

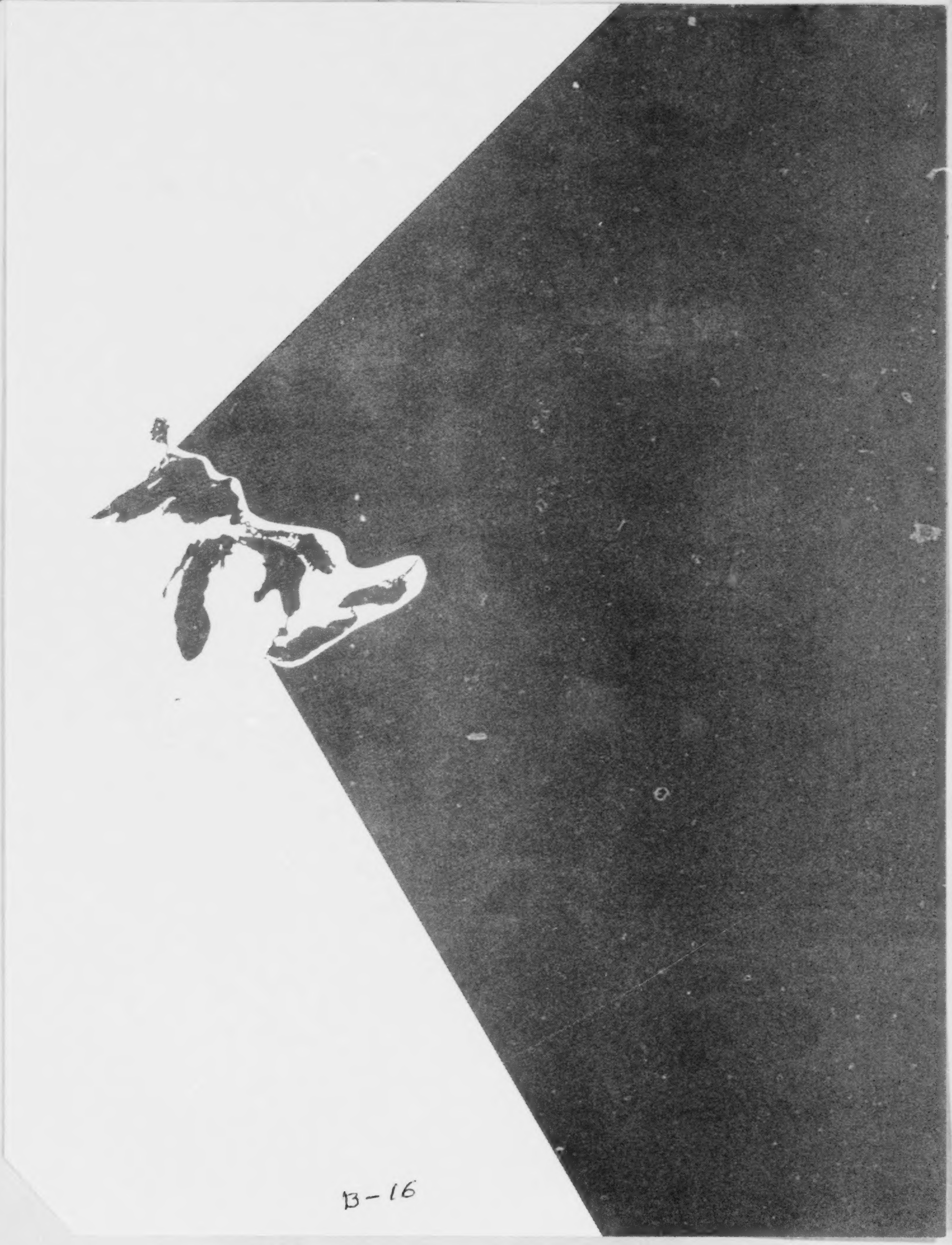
INDIANA

NAME	AFFILIATION
Janet Keck	Reporter, Hammond Times
John Brough	Director of Environmental Affairs, Inland Steel Company
James Williamson	Environmental Consultant, Clyde E. Williams & Associates, Inc.
Helen Bieker	American Association of University Women
Mike Olszanski	United Steel Workers
Sylvia Troy	Save the Dunes
James Barnett	Indiana Farm Bureau
Eileen Trump	League of Women Voters
Mark Reshkin	Panel Chairman. Professor, Indiana University Northwest
Charles Froman	Gary-Hobart Water Corporation
Elaine Kaplan	Librarian - Purdue University

LIST OF APPENDICES

The following list of appendices includes comments on the PLUARG background papers and individual comments submitted by the panel members.

1. Agriculture
2. Forestry
3. Shoreline and Riverbank Erosion
4. Shoreline Landfilling
5. Deep Well Disposal
6. Urban
7. Extractive Areas - Mining
8. Solid Waste and Sludge Disposal
9. Transportation
10. Environmental Health Issues
11. Toxic Substances
12. Recreation
13. Evaluation of Remedial Measures to Control Nonpoint Sources
14. Remedial Philosophy
15. Eutrophication in the Great Lakes



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REPORT OF THE
NORTHERN MICHIGAN
PANEL

January, 1978

C-I

I. INTRODUCTION

In response to the charge given the panel: "to review the problems, form a consensus and make recommendations for possible measures to deal with the pollution problems in the entire Great Lakes Basin"*, the panel's major and repeated concerns were public apathy and bureaucratic inefficiencies. Therefore, we decided to address ourselves seriously to those overriding problems, taking into account these three points of agreement:

1. The Great Lakes, as the largest freshwater system in the world, is of such paramount importance as a regional and international resource that spectacular innovative approaches must be taken by the governments to achieve critically needed water quality management and protection.

2. Massive dollar support will be required to finance the needed remedial measures, which will necessitate federal funding sources. Great Lakes water quality management is seen as a public project of utmost importance.

3. Overlapping jurisdictions, bureaucratic territorialism, ineffective local stewardship, lack of coordination among regulatory authorities, inadequate recognition of regional differences and regulations based on infeasible definitions instead of realistic goals all contribute to the management problems.

We propose the creation of an International Great Lakes Basin Authority,with funding, responsibility and designated authority to manage the inestimably valuable resource for the benefit of all the people.

II. RATIONALE AND SOME PROPOSED INSTITUTIONAL ARRANGEMENTS

1. The International Authority should be created in the United States by Congressional Act and in Canada by corresponding legislation, with supplementary treaties between the Governments. Legislative leadership through the collective Great Lakes Congressional delegation would be expected.

2. Funding would have to be primarily federal, from both Governments. Local and state or provincial sources are totally inadequate to treat even the serious local pollution problems, let alone lake- or basin-wide problems. In addition, all these problems affect the entire resource, are of international impact and should be supported by all the people.

3. The Authority would supercede all present governmental and bureaucratic levels in dealing with the Great Lakes resource, not simply add another level on top. It would have the authority to cut through all intermediate levels of administration and deal directly with the institutions effecting remedial actions.

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* "PLUARG and the Public", Great Lakes FOCUS on Water Quality, Vol. 3, issue 2, July 1977, page 2.

4. The Authority would be responsible for setting priorities and basin-wide water management goals, providing funding and general oversight. However, administration and implementation of specific projects and standards would be delegated to the local level most appropriate. Therefore, local pollution problems would be treated within the local jurisdiction; regional or lake-wide issues by the agency or government level needed to be most effective, coordinated and efficient. Under no circumstances would the Authority be conceived as competing in business, industrial or agricultural enterprises with private interests.

5. All laws, rules and regulations dealing with Great Lakes water quality management should be codified, simplified, clarified, made mutually consistent and regionally appropriate, as determined by realistic and attainable management goals and necessities. The Authority would recognize that regional differences, improving technologies and changing conditions require standards that are flexible and under continuing review.

6. Agencies and institutions presently involved in activities and programs related to water quality should be regrouped and reordered to most effectively and efficiently work toward problem solutions. Reinforcement and maximum utilization of existing effective organizations should be emphasized, with coordinated and clearly defined objectives and guidelines established through the Authority.

7. In cases of jurisdictional disputes, the Authority would serve as adjudicator. There should be an independent, international, representative forum for hearing and responding decisively to individuals and groups at all levels concerning redress of damages and losses due to management activities.

8. An international education program needs to be launched to support the Authority approach. It would focus attention on the immense value of the Great Lakes resource, the critical need to protect and enhance its water quality, and the complexity of interests and uses which mandates some unique management arrangements. Decisive governmental action, especially adequate funding, is the most convincing tool for persuading the public of the importance of this issue.

III. REMEDIAL ACTION PHILOSOPHY

In dealing with specific problems and remedial measures, the panel agreed on certain philosophical approaches as being potentially most effective.

1. We believe that incentives are more effective than penalties and should be used to gain compliance with remedial measures and standards. When funds to achieve the needed measures are made available, much local opposition to imposed standards and regulations dissolve. Remedial measures could be proposed as sources of income and employment, rather than economic restraints.

2. Prevention is cheaper, quicker to effect water quality improvement, and in some areas of Great Lakes water management, the only realistic approach to protection of water quality. Land uses that risk water quality degradation should be curtailed, especially near the lakes. Ground water contamination should be considered as this type of risk. Inland lakes, streams, groundwater and the Great Lakes themselves actually all constitute one complex hydrologic system. Damage to any part of the system ultimately threatens the entire system, including the Great Lakes.

3. In managing waste materials of all kinds, re-use is preferable to treatment and/or storage. Where materials such as sludge, garbage and other wastes can be used as sources of fertilizer, energy or materials, toxic substances should be kept from entering the system where possible.

4. Conservation of all resources will reduce the byproducts of human activity which pollute the environment. "Frugality" must replace "affluence" as the byword of the American way of life.

5. In developing effective water quality remedial and preventative measures, "best management practices" for various land and water uses should be emphasized, rather than arbitrary standards and inflexible zoning regulations. Such practices should be established with the participation of the interests involved for uses such as residential development, industrial location and water-related processing procedures, agricultural activities, urban planning, highway and transportation planning, recreational development, energy production, etc. For each of these uses, best management practices should be developed which would include restrictions and guidelines for avoiding inappropriate sites, without the onus of defining, identifying and "zoning" all unsuitable areas.

Remedial technology is generally well advanced and descriptions abound regarding the effects of land uses under all manner of conditions. It is the implementation phase that is bogged down in bureaucratic, jurisdictional, social, political and financial problems. Some of these implementational problems could be avoided by the best management approach rather than through land use controls such as zoning.

6. Uses of fragile, highly erodible areas should be regulated to preserve their integrity. In areas where present land uses are totally inappropriate and causing pollution problems, public purchase and reclamation should be considered as an alternative to continued efforts at treatment. "Fair market prices" methodology and condemnation authority might be needed.

7. Private ownership involves responsibility as well as rights. The idea of ownership as "stewardship" and land as a resource, to be passed on to the future as little impaired as possible by present uses, must become ingrained in the attitudes and value systems of all citizens. If we are to resist the trend of increasing public control over private rights, we must accept the "stewardship" responsibility to use the land and water resources in ways that do not significantly degrade them or conflict with the overriding public interest.

8. Education, both formal and informal, is a key part of the necessary increase in public awareness of the value and sensitive nature of the Great Lakes resource. However, we recognize that there is no educational delivery system adequate to this task. Enforcement and regulation will continue to be necessary to protect the scrupulous from the unscrupulous and to protect the rights and options of future generations.

IV. SPECIFIC RESPONSES TO THE PLUARG ISSUE PAPERS

The northern Michigan panel concurred on the four top priority water quality issues and on some recommendations relative to these.

1. Nonpoint Urban Pollution. Pathogens, heavy metals and organics are of foremost concern, followed by chlorides, sediment and phosphates in urban runoff. Suggested remedial measures include improved urban planning, including more careful industry location and development siting. Creation of more green areas, especially near waterways, to break up the generally impervious surface areas characteristic of urban use is recommended. Also suggested are improved collection and treatment of street and highway runoff to remove contaminants, and greater use of public transit systems to reduce the total impact of transportation related problems.

2. Toxic Substances from all sources. This appears to be the most difficult problem to attack because sources, especially of airborne contaminants, may be outside the basin entirely. Because of the slow flushing rates (of the Upper Lakes especially) and incorporation and biomagnification of the materials into the food chains of the lakes, keeping these substances out of the Great Lakes is essential. One reasonable approach seems to be reduction in all uses and some control over the proliferation of exotic bio-active chemicals, essentially world-wide. As much recycling of industrial processing water as is feasible is also recommended. Air pollution control enforcement coupled with tax relief or other incentive programs for the entire midcontinent appears to be necessary to control atmospheric contamination of the lakes.

3. Agricultural Practices which contribute pollutants or aggravate natural erosion. Best management practices, encouraged through considerably increased incentive and cost-share programs are considered the best approach. New cost-share programs to help farmers maintain and service abatement structures is recommended, in addition to the present first cost only programs. The panel feels, also, that the long range impacts of massive pumped irrigation, within and outside the basin, on ground water and Great Lakes water needs to be recognized. The issues of water conservation, ground water quality and water table levels must also be addressed.

4. Shoreline erosion, land filling, dredging and deposition of dredged materials. Part of this issue must be approached through ensuring appropriate uses of the shorelands. Where inappropriate and damaging land uses already exist and no effective controlling management is available, the panel recommends buying up the affected land and eliminating the inappropriate use as the most cost-effective procedure in the long run. Wherever and whenever possible, appropriate

vegetative cover should be established and maintained, especially along riverbanks and shores. Only those agricultural, forestry and development practices should be allowed which contribute to shoreland soil stability.

This report contains the philosophy and recommendations of the panel on which there was general consensus. Additional comments by individual members on the specific issue papers provided for review by PLUARG are included in the attached Appendix II. Attached as Appendix I, is a statement supported by the panel regarding this effort by PLUARG to obtain citizen input and support of its recommendations to the International Joint Commission.

UNITED STATES PUBLIC PARTICIPATION PANEL MEMBERS AND AFFILIATIONS

NORTHERN MICHIGAN

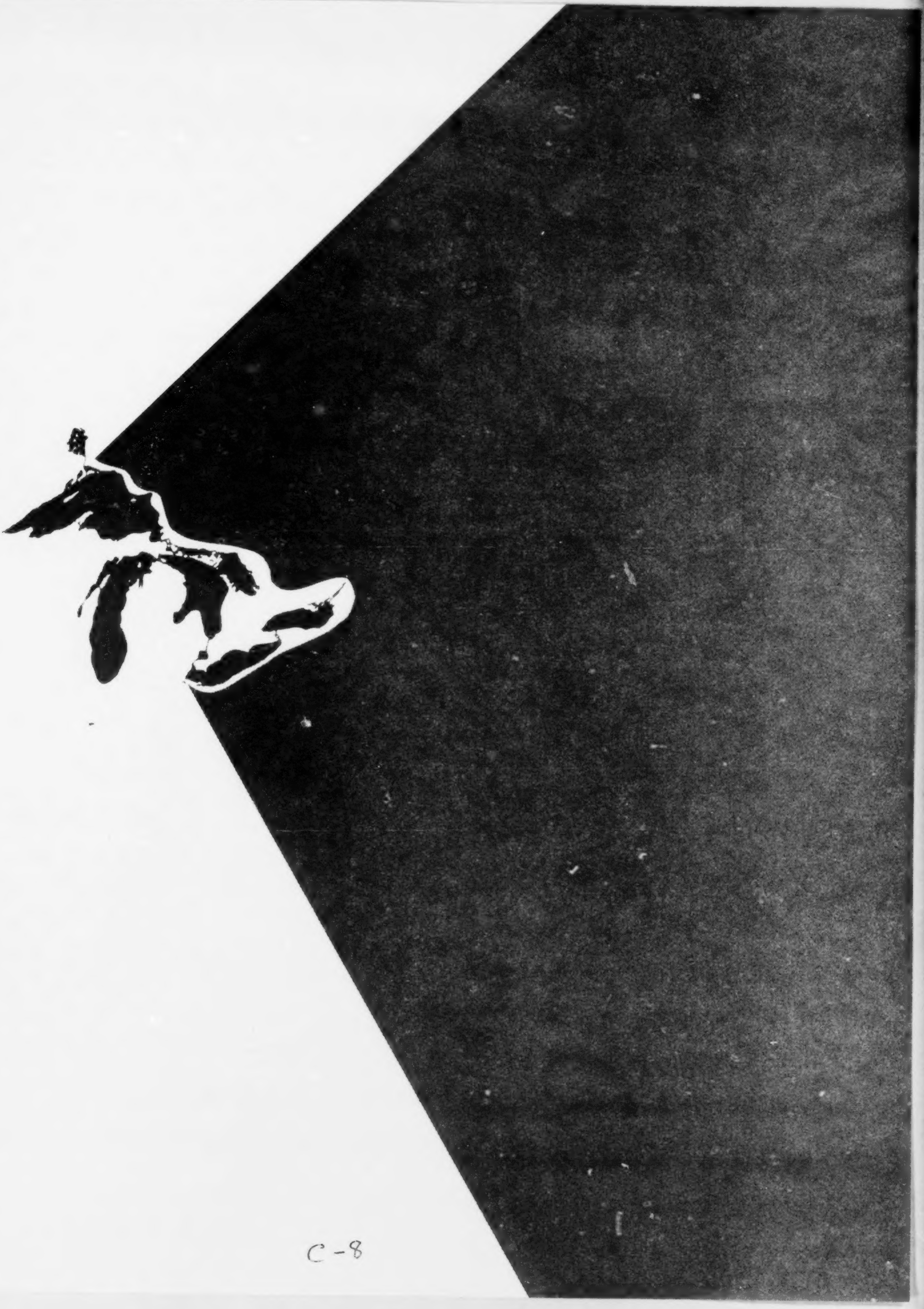
NAME	AFFILIATION
Robert Tufts	Engineer, Huron Road Commission
Peter Morrison	Farmer (Fruit Grower)
John Suffron	Director of Environmental Affairs, White Pine Copper Company
Richard Hudson	Executive - Forward Bay County
Barbara Clark	Panel Chairman, Upper Peninsula Environmental Coalition
Robert Marsh	Lake Huron Property Owners Association
Nicki Haberland	League of Women Voters
Vernie Knudson	Professor
Tom Wieland	Farmer (Beef Producer)
Jerry Frick	Secretary-Treasurer, Walkerville Well Drilling & Supply Company, Inc.
Karen Hubbard	League of Women Voters
William Robinson	Professor, Upper Peninsula Environmental Coalition

LIST OF APPENDICES

I. Resolution supported by the northern Michigan panel regarding the effort by PLUARG to obtain citizen input and support of its recommendations to the International Joint Commission.

II. Individual comments on PLUARG background papers.

   a. Urban
   b. Agriculture
   c. Transportation
   d. Recreation
   e. Forestry
   f. Extractive Areas (Mining)
   g. Atmospheric Loadings to the Great Lakes
   h. Shoreline and Riverbank Erosion
   i. Shoreline Landfilling
   j. Solid Waste and Sewage Sludge Disposal
   k. Private Waste Disposal Systems
   l. Deepwell Disposal



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REPORT OF THE SOUTHERN MICHIGAN PANEL

January, 1978

D-I

INTRODUCTION

The panelists who served on the Southern Michigan Citizens Panel represented a wide range of interest groups and professions. All were citizens who were selected by PLUARG because of their expertise and interest in water quality and environmental problems. The panel forum provided an opportunity for citizen participation and review of issue papers prior to submittal of PLUARG's report to the International Joint Commission.

The unstructured panel meetings permitted interaction between participants with minimal assistance from PLUARG members. This approach allowed panel members to prioritize non-point pollution problems caused by land use activities in the basin and recommend their own remedial solutions which they considered economically and socially acceptable. Furthermore, the panel forum provided a mechanism wherein the panelists concentrated their efforts on problem areas which they identified and continued to study more thoroughly. Seven areas of concern were examined in depth by the Southern Michigan Citizens Panel. The individual topic reports listed following were given at the last panel meeting:

Pesticides and Toxic Substances by
    Dr. Frank Sinclair, Mr. Edwin Shannon, Mrs. Grace Gluskin

Urban Runoff by
    Mr. Owen Jannson, Mrs. Peggy Johnson

Solid Waste and Sewage Sludge Disposal by
1. Mr. Russel E. Gossman
2. Mrs. Phyllis Kruse

Combined Sewer Overflow by
1. Mrs. Helen S. Willis
2. Mrs. Katherine M. Cushman

Loss of Wetlands by
    Mr. John Makris, Mr. James Carr

Agricultural Runoff by
    Dr. Dorothy Brooks, Mr. Wayne Schmidt, Mr. E.A. Wenner

Extractive Areas by
    Mrs. Jane Caplitz

One of the tasks for the panel members was to write a final report of their discussions, and develop remedial recommendations for incorporation into the draft PLUARG report. A consensus was reached by panel members that this report submitted to PLUARG would be the individual topic reports plus the two specific recommendations that were developed during the panel deliberations.

There are three specific recommendations which the Southern Michigan Citizens Panel requests be included in the final report to the IJC. The specific recommendation on education is a composite of panel discussions and the individual topic report suggestions. The second recommendation is a resolution which the panel has sent to the Governor of Michigan, the chairmen of the state's environmental commission, and director of the Department of Natural Resources (DNR). The problems arising from lack of communication and lack of credibility of the MDNR with local municipalities were evident during panel discussions and the papers submitted.

The chairperson was instructed to find common points of agreement and common approaches in remedial measures presented in the papers. These are presented as a summary of general recommendations and include seven categories of common objectives to be reached through remedial measures. All of the papers revealed a sensitivity to the complexity of each pollution problem studied and a recognition of the difficulty of correcting present non-point source pollution problems and preventing future occurences.

It was an honor to be chosen as a panel member and I sincerely believe that each citizen gained from the interaction with other panel members. PLUARG members provided an additional personal dimension and technical expertise to all of the panel discussions. The panel forum gave citizens the opportunity to comment on, and question, the materials developed through the PLUARG efforts. It was a rich experience, intellectually and personally for all members.

GOALS

At its first meeting, the Southern Michigan panel identified a list of goals for the Great Lakes. No priorities were determined for the following:

Public Water Supply
Example of Positive Action
Swimmable/Fishable
Edible Fish
Transportation
Restore Water Quality
Five Clean Lakes
Preservation of Marshes, Swamps and Wetlands
Elimination of Power Pleasure Craft
All Bodies of Water With Basin Approach to Natural Eutrophication
Useful and Available Water for Man and Animal
Institutional and Economic Arrangements to do Above
More Control of Thermal Pollution
Goals of Clean Water Act
Drinkable

RESOLUTION

On the following page is a resolution which has been mailed to the Governor of Michigan and people indicated on the accompanying letter. The resolution is self explanatory.

SOUTHERN MICHIGAN PANEL TRANSMITTAL LETTER AND RESOLUTION

December 30, 1977

The Honorable William G. Milliken
Governor,
State of Michigan
State Capitol Building
Lansing, MI 48902

Dear Governor Milliken:

Enclosed is a Resolution adopted by the Southern Michigan Citizens Panel at its last meeting held on December 12, 1977, at Long's Conference Center in Lansing, Michigan.

The panel members considered it essential that you be appraised of this problem, which is of grave concern to the panel members. The Citizens Panel requested that a copy of the Resolution be forwarded to you.

Sincerely,

SOUTHERN MICHIGAN CITIZENS PANEL

Helen S. Willis

Helen S. Willis
Chairperson

HSW/hcs
enclosure

cc: Dr. Howard Tanner, DNR Director
Stanley Quackenbush, Chairman, Water Resources Commission
Dr. Maurice D. Reizen, Chairman, Air Pollution Control Commission
Michael L. Walkington, Chairman, Resource Recovery Commission
Joan Wolfe, Chairperson, Natural Resources Commission
Patricia Bonner, Information Officer, International Joint Commission
Marty Clark, Information Officer, PLUARG

WHEREAS, the Southern Michigan Citizens Panel was established by the Pollution from Land Use Activities Reference Group (PLUARG) to gain public input prior to the submission of PLUARG's report to the International Joint Commission in Mid 1978, and

WHEREAS, the Panel was composed of citizens representing as wide a range of viewpoints and interest groups as possible, and

WHEREAS, the purpose of this panel, and the other eight United States and eight Canadian panels, was to identify significant non-point sources of pollution in the Great Lakes Basin and to suggest remedial measures most practical from a social, economic and environmental perspective to control and reduce non-point source pollution from impacting the water quality of the Great Lakes, and

WHEREAS, the Southern Michigan Panel dealt with such questions as: agriculture and urban runoff, toxic substances, waste disposal, landfills, loss of wetland areas, combined sewer overflow and pollution from the extractive industry, and

WHEREAS, the panel has recommended remedial measures for these selected non-point source pollution problems which they considered economically and socially implementable, and

WHEREAS, in all of their deliberations, the panel repeatedly came back to problems of lack of communication between the Michigan Department of Natural Resources (MDNR) and local communities, and

WHEREAS, the members of the panel expressed serious concern regarding this problem of credibility with local communities in Michigan toward the MDNR.

NOW THEREFORE BE IT RESOLVED, that the Southern Michigan Citizens Panel recommends continued and increased cooperation and educational efforts from the MDNR with local communities and increased efforts by the MDNR and other state agencies to demonstrate that proposed pollution control facilities, enforcement and regulatory programs are in the best interests of local citizens as well as in the public interest of the state as a whole.

Adopted by a unanimous vote by the Southern Michigan Panel at its last meeting, held on December 12, 1977, at Lansing, Michigan

TOPIC REPORTS

PESTICIDES & TOXIC SUBSTANCES

Remedial Measures

1. It is imperative that the Toxic Substances Control Act of October, 1976, be implemented and be supported by adequate funding.

2. Screening procedures should be vigorously researched to make possible rapid identification of potentially dangerous substances before they are placed into production. All suspect substances should then undergo extensive testing. Absolute certainty of safety cannot be realistically expected. (however, this must be visualized as the ultimate goal.)

3. Strict monitoring of the manufacture, transport and use of pesticides and toxic substances is crucial. Rigid control of waste disposal is equally important and should be an implicit part of any monitoring program.

4. A greatly expanded program should be launched to identify substances already in the ecosystem. These then should also be screened to assess their danger potential.

5. An educational program must be implemented, aimed at those populations which are engaged in the use of classified materials. It should be the purpose of this effort to emphasize the proper handling and use of these substances and alternatives which may be employed in place of their use.

6. A well funded effort must be made to devise alternatives to the use of persistant pesticides and other biocides. Of special importance here is the identification and application of biological controls wherever possible. Additionally, cultural techniques which enhance biological controls and the limited use of pesticides should be identified and encouraged.

Remedial Philosophy Questions

1. It has become increasingly apparent that the extreme persistence and other traits of most of these substances and conditions arising from their manufacture and use makes it necessary that control measures be equally administered throughout the basin; e.g., modes of application of pesticides often lead to transport via aerosols. Bio-accumulation in food webs can lead to transport via top level predators. Inclusion in agricultural products leads to wide distribution and introduction into far removed systems via sewage and household and food processing wastes.

2. Costs must be borne by producers or potential producers of the toxic substances in question. The cost of monitoring the environment will probably fall to governments, although with an appropriate tax structure applied to producers at least some of this cost could also be borne by the industries and via pricing also the consumer.

3. In addition, it would seem advisable to require the posting of performance bonds by manufacturers of toxic substances to guarantee that disposal problems and the like arising from non-compliance, bankruptcy and so forth not become a matter of public or government expense.

4. Because of the universality of the problems involved, and the fact that interstate and even international transport and impact are involved, the appropriate level for implementation would be the federal level of governments. It is likely that state and provincial governments could and would cooperate, thereby bringing oversight closer to the origin of production and the sites of use, as well as minimizing duplication of effort, since regulatory machinery already exists to some degree at this level.

5. Enforcement is absolutely necessary. We have seen too many examples of the failure of voluntary compliance, even the absolute disregard for the welfare of the environment, or more basically, human safety.

URBAN RUNOFF

PLUARG Questions

1. Are the Great Lakes being polluted by land drainage?

   It appears the Great Lakes are being polluted by runoff from urban areas.

2. To what extent, by what causes and in what localities is the pollution occurring?

   I can only cite as an example the area with which I am familiar. The Clinton River and Detroit have been listed by the IJC among 47 problem areas in the Great Lakes. These are examples of a tributary river draining urban areas and a city on the Great Lakes shoreline. Water quality in the Clinton River shows marked responses to rainfall in urban stretches. Urban runoff and combined sewer overflows have been identified as the major impacts on the Clinton River. Clinton River water quality can impact a major metropolitan swimming beach and a drinking supply intake.

   Appended is an attempt to list the sources of urban runoff pollution, which pollutants each source contributes, the impact on the Great Lakes, possible abatement measures and an evaluation of these measures for effectiveness, cost and acceptability.

3. What remedial measures would be most practicable and what would their probable cost be?

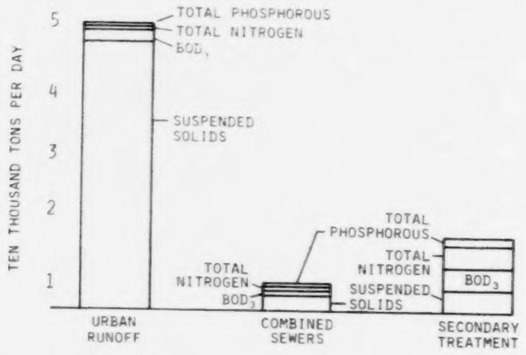
   The complexity of urban runoff does not allow any quick or easy solutions. In areas where urban development already exists remedial measures are certain to be very costly and hence must be carefully tailored to the circumstances of specific areas; thus, a good deal of information and planning must precede proposal of solutions. Preventative measures for areas of new development are likely to be more cost-effective since a variety of abatement measures can yet be considered. However, water quality control and water quantity control will have to be integrated and storm water systems planned and financed before development proceeds in a watershed. As long as the system remains "build first and worry about storm water afterwards", we shall remain plagued by flooding and devoid of reasonable opportunities for control of water quality in urban areas.

A first attempt toward abatement in existing urban areas might concentrate on public education and provision of municipal services to tidy-up the urban scene and determine the extent to which more careful housekeeping and responsible disposal would help.

Since cities are generally the points of origin of airborne pollution, water quality and air quality management must be integrated. And since automobiles are a major source of urban pollutants, urban transportation system planning potentially can greatly reduce urban runnoff pollution.

Importance of Controlling Urban Runoff

A COMPARISON OF URBAN RUNOFF, COMBINED SEWERS, AND SECONDARY TREATMENT
- ESTIMATED TOTAL DAILY POLLUTANT LOADING FOR THE URBANIZED U.S.
1990



National Summary of Waste Loads Remaining
After the 1977 Requirements Are Achieved

Variable	Point Source**	Nonpoint Source	Total Point and Nonpoint	Percentage Remaining After 1977 Requirements Are Met
BOD ultimate*	24.0	13.9	37.9	37
Suspended Solids*	11.9	145.6	157.5	92
Total Nitrogen*	7.4	28.3	35.7	79
Total Phosphorus*	1.7	1.93	3.63	53
Fecal Coliforms‡	1.95	87.85	89.8	98
Total Coliforms‡	15.0	1,268.0	1,383.0	99
Oil/Grease*	3.9	0.5	4.4	11
Cadmium‖	6.4	1.5	7.9	19
Zinc‖	67.6	51.4	119.0	43

** Estimated load remaining after achievement of the 1977 requirement.
* In million pounds per day.
‡ In number of bacteria - 10^{12}/day.
‖ In thousand pounds per day.

Source: Hydroscience, Inc., "An Overview of Waste Loads and Urban-Suburban Stream Quality Response." (Aug. 1975)

4 Journal WPCF January 1976

Conclusion: Control of urban non-point sources can importantly reduce suspended solids (sediments), nutrients, bacteria and heavy metals (and also toxics). Since the current major concerns for Great Lakes water quality are phosphorus, organic chemicals and heavy metals, sediments, control of urban runoff is important.

To satisfy expressed aspirations for Great Lakes water quality (drinkable, swimmable, fishable/edible, low rate of eutrophication)

To satisfy these aspirations, we will need to control toxics, limit nutrients, heavy metals, sedimentation, BOD, and eliminate bacteria "hot spots". Therefore, we will need to manage urban runoff to the extent it causes violations.

Remedial Philosophy Questions

1. Should remedial measures be equally administered throughout the Great Lakes Basin?

Absolutely not. An important consideration is that urban runoff and its effects vary considerably, both from place to place and from time to time. In this context, the options for centralization and across-the-board consistency in the overall application of remedial measures are very limited. From a technical standpoint (the identification and correction of the most critical Great Lakes water quality problems), and from the standpoint of economic efficiency (obtaining the best possible return on investment of pollution dollars), the application of remedial measures should be based on the concept of *variable source areas*. While such an approach may be controversial from a political standpoint, there seems to be ample justification for varied remedial measure application if we are sincerely concerned about the business of pollution abatement and prevention.

In the first place, each *lake basin* is unique in its own right. In considering urban runoff, for example, it should be considered that nearly 36% of the urban land in the Great Lakes Basin lies in the Lake Michigan Basin, while the Lake Superior Basin contains only 8% of the urban land. Remedial measures must address the question of how much of any given water quality problem is attributable to each major lake basin.

Secondly, within each lake basin one must examine the relative contribution of urban areas versus the contribution of other land uses in that same basin. In total, roughly 80% of the Great Lakes Basin population lives in urban areas and there is good documentation that these areas contribute a disproportionately large share of the total pollutant load as compared with other land uses. Carrying this one step further, urban areas in close proximity to the Great Lakes create pollutants which often move directly to the lakes without benefit of modification during transport. This difference between nearshore urban areas and upland urban areas as regards pollutant loads must also be considered. And finally, the concept of variable source areas may be related to the individual site level and its pollutant contribution as influenced by precipitation rates, soils and slopes, and infiltration rates.

In summary, we are talking about differences in lake basins, differences between urban runoff and other sources of pollution, differences between near shore and upland urban areas, and differences between individual sites. The development and implementation of remedial measures is a matter of fine tuning; for such measures to be technically sound and cost effective they must be tailored - to the geographical sources of pollution, to the types of pollutants, to the magnitude of loadings, etc. Unit loading is a useful tool for variable source programs and it recognizes the trade-offs between various sources of pollution. Remedial measures applied will represent a combination of the preventative and the corrective, the structural and non-structural, and source control versus in-transit treatment.

2. Who should pay the costs for remedial programs?

The most equitable and economically efficient association of costs with benefits over the long term will be produced by assigning the costs of pollution abatement to those whose wastes create pollution. The public is the ultimate consumer of the goods and services whose consumption causes pollution, and so *no matter how one looks at it, in the final analysis, the public will pay.* This concept is nothing more than an internalization of the costs, the "polluter pays" principle.

The exact allocation of these costs is a more difficult matter however. In an immediate sense it is the developer, the farmer, the industrialist, and the local government who will be the first to bear the increased costs of remedial measures to abate urban runoff pollution. This will be true for both on-site source reduction measures and off-site treatment measures. In both cases these costs will then be passed on to the consumer, the public. And the consuming public (as it relates to the complexity of activities taking place in urban areas) is in fact much larger than the urban area population itself. Similarly, the public which benefits from improved water quality in the Great Lakes for recreation, water supply, etc., is much larger.

In short, there is no simple formula for who pays how much, and *assigning a heavy burden of remedial measure costs to urban areas may not necessarily be as equitable as it may seem.* One point which is clear is that the improvement of Great Lakes water quality is a matter of international and national, as well as state, interest. The Great Lakes are very much a national resource and it may be that *federal financing may be the only large source of funding available to implement many urban runoff remedial measures.* Major federal funding may also have the advantage of side-stepping local fiscal constraints, political resistance, and problems of externalities whereby those who pay may not receive benefits commensurate with costs.

3. Which level or levels of government should be responsible for implementing remedial programs?

A basic and sound political maxim is that the level of government closest to a problem should deal with that problem, if that level is competent to do so. In dealing with Great Lakes water quality problems, however, it may be difficult to pinpoint which unit of government, or even level of government, is "closest to the urban runoff problem."

First, non-point sources of pollution in general are diffuse sources by nature and this complicates the "who should implement" question. Further, the ultimate water quality problems are often far removed from the initial sources or causes. That is, while conditions of pollution may initially be local phenomenon the results are much more widespread as regards the Great Lakes. While local municipalities may be closest to urban runoff pollutant sources, they may be geographically removed from the results, may lack the expertise to deal with the problems independently, and may lack the financial incentive and/or funds to deal with the problems.

There are in fact a multitude of jurisdictions involved in dealing with urban runoff from its immediate source to its final Great Lakes effect. This complex institutional arrangement -- involving two nations, eight states and a province, hundreds of counties, and lesser governmental units -- vastly complicates water quality management and necessitates its being a *joint venture and a shared responsibility*. All jurisdictions, from the local to the international -- and the private sector -- are concerned with decisions and activities affecting the Great Lakes system.

The concept of responsibility and control at the lowest level capable of handling it makes good sense (technically, politically, and economically) and should be adhered to as much as possible in the implementation of remedial measures. This will necessarily mean *action at the local level*, where source reduction and intransport measures may be taken most effectively. It will also mean local action because remedial measures will involve land use controls, performance standards, and other activities traditionally carried out at the local level. *But for a number of reasons, locally applied remedial measures will depend upon state, federal, and international support and cooperation for their success.*

Since the effects of urban runoff are more than local and affect a resource of national and international importance, such higher level support is justifiable and necessary. *Support for local implementation will be needed in the form of significant and meaningful financial aid and technical expertise.* Furthermore, to reduce overlap and to insure that remedial measures are geared to water quality problems, a coordinated basin-wide approach will be necessary. This does *not* necessarily imply creation of a super-agency, but does imply a need to insure that local remedial measures are geared to the larger Great Lakes water quality problems. The National Water Commission (1973) noted a number of courses of action worth considering. These included formation of five separate councils to focus on each of the five lakes, and creation of a Federal-Interstate compact with the power to plan *and implement* planning by integrating and directing management efforts. Such an effort would seem valuable as a means of tying together and supporting the measures which would be implemented at the local level.

4. Can measures be voluntary or is enforcement necessary?

   Implementation of remedial measures may be done directly or indirectly, through planning and/or management programs, through fiscal policies, or through other non-statutory means. *Voluntary measures, if planned carefully and with realistic financial incentives, may be more politically acceptable, economically efficient, and just as sound technically as enforced regulatory programs.* Voluntary measures based on a well-defined pollution abatement program may include provisions for education, technical and financial assistance (including cost-sharing), and monitoring.

   At the same time it should be recognized that *voluntary programs alone will not achieve the water quality improvement goals which most of us want to see achieved for the Great Lakes.* Regulatory programs will be needed in some cases simply because voluntary measures are not doing the job for a variety of reasons, and in other cases as a matter of equity. In the private sector, for example, unless given remedial measures are required for *all* developers (e.g., through legislation), individuals could be placed at a competitive disadvantage in the marketplace. While necessary, enforced regulatory programs must have sufficient flexibility to allow adjustment of policies and programs to fit a wide variety of local situations.

SOLID WASTE AND SEWAGE SLUDGE DISPOSAL

1. It is difficult to select corrective measures for this type of urgent problem. Economic judgements necessitate selection short term solutions when better solutions are available on a long term plan. Social acceptance and public education take time and also interfere with comprehensive, long term projects. Cooperative planning by a diversified list of agencies also create a bureaucratic snarl that breeds long postponements where immediate correction is important.

   Therefore, piecemeal measures, which are not the best approach, will probably be the method most often used.

Disposal

While we are still using landfill as the most acceptable method of solid waste disposal, I believe more care should be used in selecting and operating sites. Economics will dictate somewhat the distance from population centers that landfills can be located. Keeping that in mind, proximity to waterways should be considered, the type of soil should be considered, groundwater supplies noted, potential use of land studied, etc. The selection is very important and the proper practices and continued monitoring are also important. Some materials should not be placed in landfills at all. Incineration is necessary for some types of waste such as PCBs. Special facilities may have to be built to handle extremely hazardous materials. This will be expensive. It will also meet resistance from the public. The only answer to disposal of some of these materials is an outright ban of the products.

Resource Use

Resource recovery and energy efficiency must be considered along with the waste disposal problem. Municipal or regional recycling plants such as the one in Franklin, Ohio, should be built to recover our valuable resources, save energy used in the process of developing materials from virgin ores, eliminate the need for using more valuable land for landfills, prevent dangerous seepage, and in turn create a new industry that will provide jobs and a source of revenues where it now is a drain on tax revenues.

Sewage treatment plants should be built and operated in conjunction with the recycling plants. The treated water can be used in the recycling process saving water from the public water supplies. Some of the residues of the plant will not be able to be recovered, but can be used as fuel for energy. Anaerobic digesters can be constructed in this, the sewage treatment facility to manufacture methane gas to be used as another energy source.

Sewage sludge can be used in land applications as a soil conditioner. Great care must be used to make sure heavy metals or other contaminants are removed from the sludge if crop production is to be maintained on land that has sludge applied. Continued monitoring of soil, water, and air must be carried out in a sludge-to-land project.

Although our assignment on this panel is to strive for solutions to water pollution, a solid waste disposal plan should not be considered without also considering a resource recovery system. The costs of adequate leachate controls in new landfills should convince those who might be working on the economics of solid waste disposal systems to utilize the revenues from recovered resources to offset the cost of disposal.

Ultimately, complete municipal composting plants should be our goal along with the resource recovery plants. In rural areas regional resource recovery collection systems should be developed. *Clivus multrum* systems should begin to replace wasteful and unsafe flush toilets and septic tanks.

Resource recovery systems, composting plants, auxiliary methane power plants, and new type waterless toilets for rural areas are long term solutions. They should still be our goals. In the meantime, landfills, land sludge applications, and in some cases incineration, will be necessary. These operations must be constructed and operated under strict mandatory regulations and monitored by the responsible government agencies who are authorized to demand environmental quality for the health and safety of our citizens.

2. Volume

First and foremost, efforts must be made to reduce the volume of wastes produced at the source; and, especially with industrial wastes, to control the content of the waste. Controlling the volume and content of the waste must be tackled at the local level. Communities, already well aware in many instances, must be marshalled to identify specifically the problems peculiar to their areas, and mustered to find methods to correct their problems. In many instances, this will be in cooperation with neighboring communities.

Several examples of means to reduce the volume of waste follow.

1. Reusable beverage containers or containers with deposits; (in Michigan, despite intense advertising by bottlers, voters passed a bottle bill requiring all beverage containers to have a deposit or be recyclable. People were told this would cost them more money and they voted for it anyway in hopes, one would think, of having a cleaner environment and in hope of encouraging recycling.)

   This vote in Michigan demonstrated a willingness of the people to suffer some inconvenience and cost increases to reduce waste and pollution.

2. Some waste can be separated at the source: paper, metal, glass, oils and toxic substances.

   If there were financial advantages in separating waste and/or penalties for not doing so, certainly most wastes would be separated. Possibilities include: tax reductions (property tax), free or reduced cost refuse pick-up, and fines for noncompliance (state or local).

   Local communities, in agreement with regional recycling plants where communities are too small to support their own, could enforce and demand separation of waste. Recycling plants could be private or owned by a governmental unit.

   And, if the tax payers saw the advantages, both to themselves and to the larger community, they would cooperate and comply. But, dependable collection methods must be established for it to work. It will not work if customers are expected to deliver their own refuse to certain sites.

3. Composting should be promoted and encouraged.

4. Garbage disposals could be prohibited to reduce sludge.

5. Laws could mandate regional toxic or oil waste disposal sites. Perhaps any recoverable materials could be sold to customers from such sites if such materials still had some industrial use.

Costs associated with waste disposal should be paid by the community producing the waste. Each community must assume the responsibility for its own waste treatment and disposal. Proper waste disposal is the cost of living in and doing business in a community. Industries and residents alike must assume this responsibility. If one lives in the far north, the cost of heating is an added expense that is naturally assumed. Likewise, if disposal of waste is more expensive in one area than another, then that cost is naturally assumed by the community. Naturally, state and federal agencies should always encourage through penalties, regional meetings recognitions, monies, or whatever means at their disposal, the communities to meet their responsibilities.

State and federal governments may encourage improvements by:

1. establishing regional meetings of vital community members
2. financial incentives
3. establishing regulatory guidelines
4. monitoring and demanding compliance with acceptable standards
5. encourage communities to join together when necessary for mutual benefits; recycling plants - landfills - sludge or toxic or oil disposal sites - collection centers for paper, glass and metal.

Further, the location of landfills and disposal sites must be approved by departments of health who must be required to conduct environmental impact, soil condition, water tables studies, and to study all pertinent data before any new site is approved. We must begin to insist that disposal sites be located in areas where they will not easily contribute to the further pollution of our waterways. Likewise, sludge disposal sites must be carefully controlled, depending on the sampled content of the sludge.

Government must also promote research in our colleges of acceptable means to utilize our wastes.

Finally, we must remember that people want clean air, water and land. They do know of the dangers of pollution and they do find it horrifying and unacceptable. Governments at every level must establish laws and programs that encourage people, companies and farmers -- everyone -- to do what is best to preserve our waters and our environment. For doing what is best, people must be rewarded. They must see that by their extra effort savings can be made in natural resources and in money, either for themselves or for their communities. If people do not comply, there must be penalties which are enforced rapidly. It must be much easier to do what is best and what is right. There must be no financial advantage in not complying with accepted means of disposal.

The time is ripe to organize communities to solve their own problems. They are sick and tired of companies and communities that continue year after year to pollute our waters while their cases travel from court to court with no results. Much progress has been made in many areas, but there is much to do. With proper and adequate motivation and incentives it can be done.

1. COMBINED SEWER OVERFLOW ASSESSMENT IN THE GREAT LAKES BASIN

The second group of Michigan panelists, reviewing the Pollution From Land Use Activities Reference Group's material and providing input into the final report to be submitted to the International Joint Commission, selected combined sewer overflows as a contributor to water quality degradation in the Great Lakes Basin. This brief paper will identify areas with combined sewer overflow problems, review methods to correct the problem and review remedial measures which some municipalities are recommending or are implementing.

Combined sewer systems are found in many older communities, large and small, in the Great Lakes Basin. A combined sewer system carries both sanitary sewage and storm water runoff. During dry weather, a combined sewer system carries all wastewater to a central waste treatment plant for treatment before release to a watercourse. During wet weather periods and/or storm events, the flow in a combined system is substantially increased by stormwater. When originally constructed, overflow devices were installed to prevent flooding and comtamination of basements and streets. Therefore, during wet weather flows, only part of the combined overflow was released, untreated, into watercourses. However, rapid urbanization has resulted in higher peak flows occurring more often, with substantial overflows of untreated sanitary sewage and contaminated stormwater flowing into the local waters and eventually into the Great Lakes.

The impact on the water quality of the Great Lakes is not as severe as on the tributaries and bays because of the dilution effect of the lakes. However, a substantial portion of this untreated non-point pollution contributes to the high concentration of coliform organisms, phosphorus, ammonia and chlorides in the nearshore areas of the Great Lakes.

The IJC has recognized the difficulty of achieving water quality goals without addressing the problems of combined sewer overflows. Construction grant funds, administered by the United States Environmental Protection Agency to individual states, are being used by many communities to separate their combined systems or used to fund other structural measures, such as retention basins.

In 1974, the United States estimated that over six billion dollars was needed to correct the combined sewer overflow problems in the United States portion of the Great Lakes Basin, with $130 million estimated for Lake Huron and $30 million for Lake Superior.[1] Estimates for correcting the problems on the Canadian shore of Lake Huron were $150 million and $25 million for Lake Superior.[2]

The IJC has identified the following urban complexes as contributors to non-point pollution from combined sewer overflows in the various lake basins. The Duluth-Superior-Cloquet area in Lake Superior; Gary, Indiana, in Lake Michigan; Saginaw and Bay City in Lake Huron; the Detroit Metro Area and Cleveland in Lake Erie; and Rochester and Syracuse, New York, and Toronto in the Lake Ontario Basin.

There are various methods available for communities to correct the combined sewer overflow problem. Some are very costly while others may provide eighty to eighty-five percent correction of the problem with considerably less funds. One method is the installation of remotely controlled regulators, fabridams, and control gates within existing systems to provide additional in-system storage during wet weather flows. PLUARG considers the cost for regulators to vary from $1,000 to $4,000 for static non-mechanical devices to $200,000 to $600,000 for large dynamic mechanical regulators. "The development of regulators to maximize overflow quality has resulted in new consideration being given to the return to combined sewers in some circumstances."[3] Interceptor improvements and adjustments within a system to improve storage is another non-structural method which can be considered. Some communities are considering off-line storage by retention basins. As stated by PLUARG, "the advantages of retention basins depends upon hydrology and desired effluent standards, and detention basin in conjunction with a combined sewer system can yield smaller pollutant load discharges than with separate sewer systems." The costs are approximately $50/cu/m/d capacity, which may not be cost effective in all cases.[4]

Complete separation of combined sewers is another alternative available to local communities. Ecorse Creek, in the Lake Erie Basin, is uncombining its system plus alleviating flooding conditions, for a cost of between $20 to $25 million. In the Detroit system, "total separation is estimated to cost in the order of $3,250 million for Detroit alone."[5] This does not include the 75 other communities tied into the Detroit system. Construction of parallel sewers is another costly alternative.

Non-structural alternatives are applicable for controlling pollution from combined sewer system overflows. Disconnecting building downspouts from sewers would allow precipitation to infiltrate into the soil and reduce the total amount of stormwater getting into the system. Disconnecting foundation drains from sewers is another method of reducing the amount of stormwater in combined systems, as is roof top retention of precipitation in new buildings. Increased street sweeping, ponding of precipitation in parking lots, application of best management practices, increased weir elevations within interceptors, selective blockage in main interceptors and more efficient sewer maintenance are options that local communities are considering when upgrading treatment plants.

In the Lake Ontario Basin, both Canadian and United States municipalities are addressing the water quality issues resulting from combined sewer overflows. In Toronto, the metro area plus two-thirds of the boroughs have undertaken a four-phased project which will provide treatment for overflows as a start. Over the next two to three year period, Toronto will install automatic control devices for central operation of overflow points along sewers.[6] Rochester, New York, has used a rational and cost effective solution to the abatement of both storm and combined sewer overflows. As a first phase of an overall abatement program to achieve the water quality objectives of P.L. 92-500, best management practices were developed. The program consists of interceptor improvements, blockage of high impacting overflows, overflow weir height adjustments, regulator modification, addition of control structures, preparation and implementation of a central control system, a program of improved system maintenance and preparation and implementation of source control regulators.[7] Rochester estimates that the above outlined program when implemented "will reduce the annual discharge of combined sewer overflow to the Genessee River by approximately 85 percent."[8]

In the Lake Erie Basin, the City of Detroit overview plan does not consider the $3 billion cost for separation of combined sewers a viable alternative. The draft plan is considering storage in-system and off-site by retention plus treatment of overflow before discharge to watercourses. Costs have been determined for one, four and twelve overflow occurences per year, with the twelve per year most cost effective. No decision has been made as to what plan will be adopted, but studies have revealed that the present collection system has an overall in-system storage capacity of 170 million gallons. Most of this amount can be controlled remotely to reduce the number of overflows.[9] Presently, eighty overflows occur yearly just along the Rouge and Detroit rivers and impact upon the water quality of the nearshore waters of the Detroit River and Lake Erie.

Saginaw and Bay City in the Lake Huron Basin have included in their construction grant program methods to alleviate overflows. Saginaw is adding two retention basins while Bay City plans to construct three retention basins plus separate one third of its existing combined system in the first construction phase. Additional phases of construction in Bay City will include separation of the remaining combined sewers plus construction of needed retention basins.[10]

Recognition of the impact on water quality by combined sewer overflows has prompted American municipalities to develop programs to abate this non-point source of pollution through utilization of construction grant funds. Planning under Section 208 of P.L. 92-500 has further identified the impact of combined sewer overflows on local water quality. Cost/benefit analysis studies to correct combined sewer overflow problems must be conducted under Section 61 of Phase I in the NPDES Construction Grant Program. When these studies are completed, the communities must weigh the benefits in improved water quality against the cost in dollars of eliminating all combined sewer overflows.

Remedial Philosophy Questions

The Remedial Philosophy questions apply somewhat differently to the combined sewer overflow problems discussed above.

1. Should measures be equally administered throughout the Great Lakes Basin (e.g.: Should distance from the lakes, soil type, amount of rainfall etc. affect implementation of remedial measures?)?

   Combined sewer overflows are non-point sources of pollution which can be identified as originating within existing municipal sewage systems. The pollution from combined sewer overflows varies with the design, age of existing systems, number of overflow points along streams etc., and not from soil type, distance from lake, etc. There would be no logic in attempting to administer remedial measures throughout each lake basin because each municipal system impacts differently on Great Lakes water quality, and not all communities are affected by this problem.

2. Who should pay the costs for remedial programs?

   The costs for controlling and/or eliminating combined sewer overflows cannot be assessed basinwide. The costs should be borne by the affected communities within a combined sewer system. With 75 percent federal grants and 5 percent state grants, the affected communities will be responsible for the remaining 20 percent costs.

   The impact of combined sewer overflow is different in each community in a large integrated system, such as Detroit, which services 76 communities. Because the system has been enlarged piecemeal over a long period of time, newer customers have designed their collection system, including interceptors, to alleviate this problem or have constructed retention basins concurrently. However, a city like Dearborn, within the Detroit system, has an older combined system and now experiences 47 overflow occurences per year in the Rouge River. It may consider to correct the problem through structural or non-structural means, such as constructing a costly parallel interceptor or retention basins, or treatment of overflows prior to reaching the Rouge River. The costs of the improvements will depend upon the benefits that citizens of Dearborn desire to achieve. It would be unrealistic for all users of the Detroit system to assume any of the costs of correcting Dearborn's overflow problems.

3. Which levels of government should be responsible for implementing remedial programs?

   All levels of government should be involved and work cooperatively. Local communities are required to address combined sewer overflows in their construction grant proposals. The state is required to issue the NPDES permits after their assistance and approval, and the USEPA is required to give the final approval and required federal grants. In essence, the local community must recognize the problem and be assisted by the state and federal governments in correcting combined sewer overflows. The magnitude of the combined sewer overflow problem in relationship to other pollution problems, the possibility of successfully correcting the problem in relationship to other in-house problems the degree of treatment required, the cost involved, must all be weighed equally when designing a new system or upgrading an existing system. It may be that the right economic and social decision will be to correct up to 80 to 85 percent of the pollution problems associated with overflows and not attempt to get 100 percent correction.

4. Can measures be voluntary, or is enforcement necessary?

   Voluntary measures could be interpreted as best management practices, as illustrated by the Rochester, New York, program. In-storage capacity, better maintenance and operation, new control devices, etc. would all be indications that the local community is attempting to deal with combined sewer overflows in a cost effective manner. Enforcement would depend upon the overall quality of the effluent after all construction and/or best management practices are completed. Enforcement is delegated to the state if the local community does not implement its entire pollution control program.

Footnotes

1 International Joint Commission, Great Lakes Water Quality 1975 Annual Report Fourth Annual Report to the IJC, Great Lakes Water Quality Board, 1976, pg. 59.

2 International Joint Commission, Upper Lakes Reference Group, The Waters of Lake Huron and Lake Superior, Volume I, Summary and Recommendations, Windsor, Ontario, 1976, pg. 159.

3 PLUARG, Evaluation of Remedial Measures to Control Nonpoint Sources of Water Pollution in the Great Lakes, October, 1977, pg. 65.

4 *Ibid*, pg. 42

5 Giffels/Black and Veatch, Overview Plan with Environmental Assessment, Book I. Part 2 of 2, June 7, 1977, City of Detroit Water and Sewerage Dept., pg. 7-38.

6 IJC, Great Lakes Water Quality 1975 Annual Report, pg. 61.

7 USEPA, Best Management Practices for Non-Point Source Pollution Control Seminar, November 1976, pgs. 265-266.

8 *Ibid.*, pg. 267.

9 *Op. cit.*, Giffels/Black and Veatch, pg. 7-28.

10 *Op. cit.*, IJC, 1975 Report, pg. 39.

2. Since Helen Willis' paper is excellent and comprehensive, I will not attempt to write another, but rather will comment on the problem as I see it.

First, we must understand the vast amount of ignorance and apathy about the problem of combined sewer overflow. Not many members of the general public are aware that raw sewage in such amounts is being released into our rivers; even fewer consider it a threat to their well-being, and almost no one knows what kinds of measures can and should be taken to deal with it.

Therefore, we cannot assume that communities will make logical choices about spending money to combat pollution. In my opinion, almost no community will take action against combined sewer overflows unless impelled to do so by federal and state action.

Even when public officials are aware of problems of combined sewer overflows, they know so little about ways of combatting them that they are inclined to shrug them off as of little or no value.

This leads me to believe that several kinds of educational efforts must be made, aimed at various groups, such as general citizens, students, public officials. Specifics and, where possible, success stories must be included to point the way.

One area that I consider of prime importance is that of maintaining adequate flow in our streams and rivers. Some pollution is bound to reach these waters, if only from overland, or from natural life cycles of animals and plants. We must maintain flow to minimize the effects of this pollution. Therefore, too much emphasis on use of sewers can defeat its own purpose. Also this points up the importance of wetlands, which maintain flow in dry times.

Further use of previous paved surfaces needs to be included as a remedial measure.

Remedial Philosophy Questions

1. Should measures be equally administered throughout the Great Lakes Basin (e.g., Should distance from the lake, soil type, amount of rainfall, etc., affect implementation of remedial measures?)?

   To make a single answer to such a general question might well lead to chaos. In my opinion, we need to examine each type of remedial measure separately. If we are talking about grants for sewers and treatment plants, obviously we need to correct the largest problems first. However, if we are talking about requiring that certain street sweeping practices be used, or that no downspouts be connected with sewers, I feel that application should be area-wide.

   We must remember that we are looking at long range results in correcting water pollution. The more we correct problems close to the sources, the better off we will be. I believe that we are going to find more connection between remote areas and lake pollution the more refined our instruments become.

2. Who should pay the costs for remedial programs?

   As a resident of Dearborn, I must disagree completely with the statement that it is up to the citizens of Dearborn to correct overflow occurences in Dearborn. Much of the water released into the Rouge River in Dearborn originates miles away, some even in Oakland County. Dearborn happens to lie at the mouth of the Rouge, at the confluence of all its branches. Sewers were built to empty into the river at its low point, which happens to be in Dearborn. Therefore, some of the local share of alleviating this problem must come from others contributing to the problem.

   Once again, if the decision is left to the citizens of Dearborn, very little will happen. Remedial measures will be taken only if federal and state governments hold out the carrot and are ready to use the stick.

3. Which levels of government should be responsible for implementing remedial programs?

   All levels of government must be involved. Financial assistance and education must come from federal and state levels. Much more work must be done to educate local officials, and to work cooperatively with them. However, I believe that administration of remedial measures can best be planned and monitored on a regional basis. Consideration must be given to river basin areas, and to sewer system areas in this planning. Maintaining river flow is a river basin problem; in-system storage of wastewater is a sewer system problem. Some sewer systems are extremely complex and may affect more than one river basin.

Writing laws requiring remedial measures must be done very carefully by experts.

4. Can measures be voluntary or is enforcement necessary?

   Communities should be encouraged to take measures on a voluntary basis, and to go beyond the basic requirements of the law. But I have already given my firm opinion that nothing will be done until it is clear that state and federal governments will enforce the laws.

LOSS OF WETLANDS

Loss of wetlands is an important consideration in terms of Great Lakes water quality. The retention, preservation, and even rehabilitation or restoration of wetland areas in and around the Great Lakes could be a significant part of the solution to problems of deteriorating Great Lakes water quality. The destruction or loss of wetland areas will contribute to the deterioration of Great Lakes water quality. It probably will also result in increasing the costs of any remedial measures to be taken to correct present or future levels of deterioration in water quality.

Preliminary to answering the remedial philosophy questions that we have been asked to address, we would like to cite some information regarding the importance of wetlands, their value and the history of wetland losses in the last 100 years. The information is taken primarily from a recent paper prepared by the Land Resource Programs Division of the Michigan Department of Natural Resources (DNR).

The use of wetlands and their loss have two primary environmental impacts. The first directly affects water quality in the filtering, cleansing and retention aspects of wetland areas. The second impact is on wildlife and the population of wildlife that is sustained and enhanced by the use of the wetland areas.

The wetland areas have a direct impact on water quality, particularly, Great Lakes water quality, becuase of their known filtering and cleansing action on waters that flow into the Great Lakes. There has been a great deal of information generated regarding these functions, and in fact there are communities which have decided to use the natural cleansing effect of wetlands areas as a sewage treatment method. The other direct impact on the water quality by the wetlands areas is their retentive properties. This means that they will retain waters that flow to the Great Lakes so they help prevent a flooding effect from a large amount of water, flood waters, coming from upstream sources. This retentive effect can be said to affect water quality, because it stabilizes the Great Lakes water levels, helping to minimize shoreline erosion problems and other accompanying problems from increased water levels in the Great Lakes. This effect is particularly evident in areas where wetlands have been drained extensively and we now have increased shoreline erosion problems. The Monroe area in western Lake Erie, is a particularly good example of this phenomenon. The cited DNR study indicates that Michigan has lost approximately 70% of its original coastal wetlands since the mid 1800's. Further, the data suggest that at least 20% of the existing coastal wetlands may be developed by private interests within the next decade.

It is this anticipated future loss of wetlands that is particularly important for us to keep in mind when we discuss the loss of wetlands.

There are two pieces of legislation of significance to the problem of continuing loss of wetland areas. The first is the Coastal Zone Management Act, which was passed in 1972 and provides United States federal impetus for state action for protection of coastal areas and also some federal funding to match with state funding in this area. The second act of importance is the Shoreland Protection and Management Act of 1970. It is a Michigan law which calls for identification and protection of our coastal lands, including wetlands areas.

It is our feeling that although both of these pieces of legislation are useful and have helped in protecting our wetland areas, there is need for further and stronger legislation of a land use planning nature so that we can avoid future losses of our very important areas. We feel the solutions to the loss of wetlands problem will initially require additional legislative action.

The second area of wetlands impact is on wildlife. Wildlife use wetlands in a number of different ways: migratory waterfowl use wetlands as resting and feeding areas; wetlands are used extensively as waterfowl breeding areas; they are good areas for waterfowl hunting; they serve as home to certain fur bearing animals, such as racoons and muskrats; they serve as fish spawning, nursing and feeding grounds for numerous species of high quality fish, and wetlands are habitat for amphibians and reptiles such as turtles, snakes and frogs.

All these uses of wetlands by wildlife have economic impacts and value. Wetlands include areas of commercial fishing, sport fishing, and hunting. The recent study by the Michigan Department of Natural Resources assigned dollar values to the different uses. These values are as follows: for sport fishing they assign a value of $286.00 per acre year; for commercial fishing, $3.35; for water hunting, $58.50; for fur bearers and trapping of fur bearing animals, $36.50 per acre; for recreational non-hunting and non-fishing activities, they assign a value of $152.50. This is a total of $536.50 per acre per year.

Other roles of wetlands, in terms of their pollution absorbing capabilities, are harder to put a dollar value on, but recent studies have suggested that the value of an acre of wetlands for phosphorus removal, secondary and tertiary waste treatment could be in the area of $3,730.00 per acre per year.

All of these dollar values were arrived at from conservative neasurements, and while they are not exact figures, they certainly are sufficient to establish the significant economic value of wetland areas.

The other significant factor we must address is that we have seen a great loss in wetlands in Michigan over the last approximately 100 years. Although the coastal wetlands of Michigan are only 3.3% of Michigan's total wetlands, they represent our most valuable wetlands.

The costs for the remedial programs should be borne by a combination of state and federal government funding. It is not realistic to expect that local governments will be able to afford the costs of such programs, if in fact they are willing to bear the costs. There are two different approaches that can be taken to saving the wetlands areas: the first is outright purchase of these areas by the government; the second is limitations on development, primarily through zoning and other land use limitations. The actual purchase of such wetlands areas will necessarily be something that the state government will undertake, but there should be a shared funding between state and federal government for the costs of any such purchases made. The second approach will very likely require local action through land use limitations and zoning, but it is not realistic to expect that the local government will be able or willing to absorb the costs involved. The local government, in addition to restricting the use of this land, will, in most cases, be restricting development that could conceivably result in future revenues. Since the local governments would be foregoing potential future revenues, it is not realistic to expect that they would have the money to pick up any costs involved or that they would even be willing to pick up any costs involved, in making purchases on a current basis.

Legislation to restrict or prohibit the development of wetland areas appears attractive since it would most likely not involve any initial costs and would take a minimum amount of administration. We might also take the time to observe that the protection of existing wetland areas must necessarily involve costs substantially less than those of trying to reestablish or restore wetlands once they have been damaged or lost.

Remedial Philosophy Questions

The response to the first remedial philosophy question regarding equal administration throughout the basin is that there should be equal administration throughout the basin for actions to preserve our wetlands. There should be equal action taken to preserve as much of the wetlands in the Great Lakes Basin as possible. The nature and location of wetlands is going to result in an impact only in the areas where wetlands are located, but it is necessary that there be equal administration in order to save all or as much of our wetland areas as possible. Legislative action to prohibit, greatly restrict, or prevent the development will of necessity cover broad areas of state or national jurisdiction, but also will quite logically impact only on areas where wetlands or their feeder water supplies are located.

Productivity may well increase due to technical advances, such as genetic engineering. However, it is doubtful that rates of pesticide and fertilizer usage will continue to increase. Economic constraints from costs of energy and chemicals are already being felt by farmers. In addition, ecological constraints are certain to limit such practices.

Page 4 states that "many farmers are supplying more fertilizer phosphorus than is necessary." It states that 2.6 times more fertilizer phosphorus than is necessary was being used.

It is difficult to believe that farmers are wasting $1.60 for every $2.60 they spend on fertilizer phosphorus for corn. That implies an extremely poor business sense on the part of the farmers.

On page 6, it is stated that herbicides have minimal environmental impacts on the Great Lakes. However, no mention is made of the potential toxicity of these chemicals to aquatic vegetation.

The discussion of sediment input from agricultural practices raises a number of questions. It is stated on page 7 that: "Sediment has not generally been considered as a pollutant of concern to Great Lakes water quality." We would ask who has made that conclusion? While this statement may be accurate for the lakes as a whole, it is a major problem in connecting channels such as the Detroit River when it has to be periodically dredged for shipping. It is an extreme problem in the Saginaw Bay where submerged vegetation has been reduced by 90 percent, with sedimentation being a major part of the reason.

We believe that the magnitude of the problem was qualitatively and quantitativel underestimated. The figures on page 8 (34-1159 lbs./acre/yr.) seem extremely low.

In one study in Wisconsin[1], soil losses ranged from 2.3-24.8 (short) tons/acre/yr. The report referred to other studies from Iowa where soil losses of 40-50 tons/acre/yr. "were not uncommon." The study concluded that "in 70 percent of the (samples), estimated soil losses, on the average, were more than twice the amounts considered compatible with permanent agriculture."

A further indictment of generally poor soil conservation practices used by farmers in the Great Lakes Basin was presented to us in the preliminary results of the U.S. Great Lakes Pollution Survey. These results reflect poorly on the generally perceived notion of farmers as stewards of the land, guardians of the soil, individuals concerned about the long term productivity of our croplands.

It is obvious that we cannot eliminate the use of chemicals in the production of our food stuffs. But we do not perceive the choice to be between "either food or clean water." Those needs can, they must, be compatible.

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[1] Brink, R.A., J.W. Densmore, and G.A. Hill. "Soil deterioration and the growing world demand for food." Science 197 (1977) pp.625-630.

The people of the United States have determined, through the Congress, that "it is the national goal" that all our waters be fishable and swimmable by 1983 and that there be zero discharge of pollutants to those waters by 1985. Although agriculture will never be able to literally meet the 1985 goal, it certainly can conform, must conform, to meeting the 1983 goal. The only questions are how long will it really take, and how much will it finally cost.

But the question of mandating best management practices on individual farms is as complex as the entire agricultural industry. Every aspect of that industry, including the consumer, will be impacted if those goals are to be met.

The technical know-how exists. The excellent PLUARG report, "Evaluation of Remedial Measures to Control Nonpoint Sources of Water Pollution in the Great Lakes," adequately demonstrates that the remedial measures are well known. The above cited survey just as forcefully demonstrates that many farmers, for whatever reasons, are not employing those known management practices.

Remedial Philosophy Questions

1. Should measures be equally administered throughout the Great Lakes Basin?

   If pollution control measures are to have any credibility with the public, they must be flexible enough to address specific problems. Laws to protect the environment must be designed for maximum protection of the threatened resource, not designed for maximum convenience of the enforcing agency. They must be administered equally, but they must also be administered fairly. In hydrologically active areas, restrictions must be more stringent to reflect the greater ecological sensitivity of the system.

2. Who should pay the costs for remedial programs?

   The principle is simple: the polluter pays. The implementation of that principle is not so simple.

   The concept of tax subsidies to farmers to institute best management practices is attractive, and certainly is politically popular, especially with farmers. In the Great Lakes Pollution Survey, only 17.5 percent of the farmers thought the federal government should administer pollution control regulations for farms, but 66.9 percent thought the federal government should help pay for that pollution control. H.R. 3199, a proposed agricultural cost sharing amendment to Section 208 of P.L. 92-500, is an approach to such federal subsidies.

   Tax subsidies may be necessary for capital improvements (stream fencing, etc.) on a one-time basis. However, in the long run, those costs must be internalized into the costs of the operation and passed on to consumers. We do not believe that farmers should be paid tax monies to practice many of the soil erosion control techniques which should be a natural part of sound land management on any farm --leaving vegetative cover along water courses, terracing, returning organic residue to the soil, restricting fall plowing on erosion-prone fields, and so on.

3. Which level or levels of government should be responsible for implementing remedial programs?

   In an oversight capacity, the federal government must regulate these programs to insure uniformity of enforcement throughout the basin. This function is as necessary for regulating non-point pollution sources as it is for point sources. No state or region should be able to gain an economic advantage through allowing poor soil erosion practices --i.e., mining the soil.

   However, direct implementation must be the responsibility of agencies closest to the resource. We believe local soil conservation districts are best able to make the (often subjective) judgements as to the degree of controls needed on any particular farm. This raises a whole spectrum of questions on problems of funding, legislative authority, etc.

4. Can measures be voluntary, or is enforcement necessary?

   The question may be moot, since mandatory enforcement measures may be politically impossible at this time. We believe that additional monies must go into public information programs on the magnitude and importance of soil erosion and chemical runoff problems. Farmers must have a period of "grace" to come into voluntary compliance with best management practices.

   Because of the economic realities of farming, we doubt such voluntary means will suffice. If, by 1981, the problem is not significantly improved, legislative authority should be sought for mandatory enforcement. This may be accomplished through a variety of means, such as removing the exemptions for agriculture from the Michigan Soil Erosion and Sedimentation Control Act.

EXTRACTIVE AREAS (MINING)

I am having trouble reconciling the seemingly innocuous effects of the extractive industry on water quality, as delineated in the background paper, with statements made and material available in other reports. It is almost as if the paper were written by an apologist for the various mining interests or that the whole matter was not worthy of much attention. Since extraction is expected to increase greatly in the future, stringent controls and regulations must be in effect to prevent a series of "Sudburys".

Page 4, PLUARG studies: Surely more than the monitoring of 2 sand and gravel operations was called for. Who conducted the "ongoing monitoring studies of the mining industry", government officials or the industry? What types of extraction were monitored, for how long, what conclusions were reached, if any? How were reports verified?

The Extractive Areas report did not mention several minerals such as bismuth, asbestos, arsenic, cobalt, mercury, nickel, sulfur, which have a high potential for causing water damage to water quality somewhere in processing. We are also concerned with deposition of harmful materials from atmospheric sources and can hardly ignore the sulfides, arsenates, asbestos fibers, dusts, radon gas, etc. which are released at point of extraction and initial handling. The report does not mention these at all, focusing instead on the usual problems of acidity, precipitation and storage of tailings. The condition of ground and water around Ducktown, Tenn. from the years of mining and smelting copper and zinc sulfide, should come as a frightening stimulus to achieve clean air and water at all other mining operations. The goal should be no contamination from mining and initial processing. Perhaps we need total bubble environments for all mining operations. More attention is given to the effects of heavy metal concentrations in the Environmental Health Issue Paper (Sept. 1977) beginning on page 22. Particular emphasis should be given to p. 24, last paragraph.

Similarly, the connection between sludge or sludge disposal and groundwater contamination seems not to have received enough thought. Should there not be studies conducted now on the feasibility of actively establishing planned reservoirs, not temporary settling basins, of our present mine refuse, recognizing the fact that as new needs arise and mew methods of concentration become available we can rework these materials in a hundred years? We cannot dump in or near lakes and streams.

The idea of using deepwell disposal for any of these present day waste products seems easy but not always safe. I particularly deplore the ever suggested procedure of using salt mines for radioactive wastes. Shouldn't they be in reinforced caverns in the Pre-Cambrian Shield - not the more permeable formations?

Two examples of cavalier treatment of the environment of others lead me to the conclusions concerning enforcement measures that are personally displeasing to me. The Reserve Mining Co.'s position on Lake Superior is medieval and on page 4, Extractive Areas, we find the elevated pico curie level cannot be brought under control by regulation or enforcement. As a one-time firm believer in "least government is best government", and a fierce defender of industrial rights, I am forced to the conclusion that remedial and preventive measures will not be voluntarily taken by some who will react only to present threats of fines and prompt court action. Unfortunately, local officials are also often reluctant to annoy sources of income, so we need super-agencies. Of course, all costs will be passed on to ultimate consumers.

RECOMMENDATIONS

Following are three specific recommendations which the Southern Michigan Citizen Panel would like incorporated into the final PLUARG report as recommendations to the International Joint Commission.

EDUCATION

There must be increased public educational efforts at all levels to inform people of water quality problems caused by pollution from land use activities. Citizens and all levels of government should be made aware of what must be done to improve water quality in the Great Lakes and prevent future degradation of the lakes.

RECOMMENDED ROLES OF THE FEDERAL, STATE AND PROVINCIAL GOVERNMENTS

1. Continued research in all areas of non-point sources of pollution that affect water quality. Research efforts should be done on a basin-wide, individual lake basin, regional, watershed and stream segment basis.
2. Compilation of all new data into a central office for easier accessibility.
3. Analysis of new data and re-evaluation of old data in light of new information regarding the impact of non-point sources on Great Lakes water quality.
4. Preparation of reports based on data analysis and evaluation and distribution of these reports to the public. Reports would need to be written for various levels of comprehension, that is, for agencies, universities, secondary and elementary schools, citizens and local officials.
5. Designate an agency(s) or develop another institution to:
    a. Collect and distribute the above information to local units of government, libraries, universities, school systems, watershed councils, etc.
    b. Develop a directory to include all names, addresses and telephones of specific people, organizations and agencies which could be contacted for assistance by local units of governments and citizens when faced with an environmental problem.
6. Development of a mass media effort to:
    a. Educate people on how their individual actions, such as littering, application of too much fertilizer, allowing leaves to accumulate in gutters, changing oil in the streets and allowing the oil to go down a storm drain, not applying best management practices to agricultural land, etc. impact on water quality.
    b. Inform citizens and elected officials of the need to consider resource recovery as a viable alternative to putting wastes into landfills, to coordinate planning of municipal wastewater treatment plants with resource recovery and land application of sludge, to coordinate planning for future development with storm water management, the need for retention of wetlands, the impact of hazardous materials on water quality, etc.
7. A concentrated effort by the Michigan DNR to strengthen its information and education divisions and develop lines of communication with local units of government and citizens.
8. Approve a method of providing matching funds to counties in order that each county can establish an environmental ombudsman position.

RECOMMENDED ROLES FOR COUNTY GOVERNMENTS

1. Establish an environmental ombusdman position through use of matching funds arrangements.
2. This individual would:
    a. Assist local units of governments and citizens in getting in touch with the needed department or agency responsible for environmental protection and enforcement.
    b. Distribute information from the suggested new information agency.
    c. Assist local communities in developing an awareness of the need for including environmental parameters in all new construction within their jurisdictions.
    d. Assist local communities in developing an integrated approach to environmental management and planning.
    e. Assist local communities and citizens to accept alternative solutions to local problems. Social acceptance of land application of waste water sludge as an alternative to landfills is an example.

TOPIC REPORTS RECOMMENDATIONS

The specific topic reports submitted by the panelists covered a wide variety of problem areas caused by non-point sources of pollution from land use activities. All of the panelists recognized the complexity of the pollution problems they reviewed, and they pointed out that it will be very difficult to implement their recommendations without public acceptance of responsibility, choice of remedial alternative and adequate funding.

Although the topics covered were different, common concerns and objectives, and suggested remedial solutions can be found in each report. This allowed for summary of all the reports into the seven specific categories of general recommendations to PLUARG outlined below.

EDUCATION

Paramount in all of the papers was the need for more education of the general public and elected officials about existing and potential water pollution problems. More assistance must be given to citizens and elected officials on how to correct or reduce the amount of non-point source pollution from impacting on the environmental health of the Great Lakes. Panelists recommended that there is a need for basic re-education of values and individual pride.

PREVENTIVE MEASURES

There was an overall consensus by the panelists that communities must consider preventive measures to control the effects of pollution from land use activities. The following is a composite of individual report preventive recommendations. They are not listed in order of priority.

a. Planning and coordination of municipal wastewater treatment plants and residuals disposal with resource recovery and land application systems.

b. Adequate planning for stormwater management prior to development.

c. Use of retention areas and treatment of combined sewer overflow before discharge to streams.

d. Reduction of waste materials at the source.

e. Coordination of transportation systems and water quality planning and management.

f. Coordination of waste water facilities and energy consumption.

g. Incineration of toxic substances under controlled conditions.

h. Identification of potentially dangerous substances before production.

i. Purchase of important wetland areas.

j. Proper site selection for landfills which takes into account proximity to watercourses, type of soil, ground water supplies, etc.

ENFORCEMENT OF EXISTING LEGISLATION

Better enforcement of existing legislation is a requirement if the environment is to be protected. It was the panelists' assessment that existing laws are sufficient to carry out an integrated pollution abatement program. However, enforcement is not as successful as it should be under the legislation already passed in Michigan because of lack of adequate funds and staff. Except for toxic substances and pesticides, panel members did not recommend that remedial measures be equally administered basin-wide. Voluntary methods of controlling pollution should be attempted first, and, if not successful within a specified time period, mandatory controls would be necessary.

EXPANSION OF MONITORING

Panelists agreed that an expanded monitoring program is essential to understand non-point pollution effects on water quality. Panelists recommended the following expanded monitoring programs:

a. Pesticides and toxic substances. Past injuries to the ecosystem must be evaluated as well as potential future problems.

b. Evaluation of voluntary best management practices on agricultural land in order to recommend a continuation of voluntary measures or recommend legislation for mandatory practices.

c. Combined sewer overflow best management practices.

d. Sludge application on soils: for metals, toxic substances and success in improving soil fertility.

e. Groundwater contamination from landfills.

f. Mining activities: for sedimentation, turbidity and residuals.

COSTS OF REMEDIAL PROGRAMS

It was suggested in most papers that in the final analysis, the public will pay, either through increased taxes or increased cost of production. The initial expense for pollution control of non-point sources will be borne by the manufacturer, farmer and government, but these costs will be passed on eventually to the consumer and taxpayer.

GOVERNMENT COOPERATION

All of the papers recognized that non-point source pollution remedial measures cannot be initiated or realized without increased communication and cooperation among all levels of government. Local communities must recognize that they are responsible for much of the pollution problems in their areas, and must assume responsibility for treatment and ultimate disposal of wastes. Local efforts would be tied in with regional, state, federal and international efforts. The best arrangement would be initiation of efforts for pollution control by the local government with financial and technical assistance by state and federal governments.

INNOVATIVE REMEDIAL MEASURES

Many of the papers suggested innovative methods to deal with the problems discussed. They were methods which would not be considered time delay solutions. The following list is only a sample of some of the measures which the citizens panel considered desirable and implementable.

a. Performance bonds for manufacturers of toxic substances to guarantee that disposal problems arising from non-compliance and bankruptcy would not become a problem and expense for government.

b. Development of a system of financial incentives for industry and individuals, such as tax reductions for compliance and fines for non-compliance.

c. Preservation of wetlands through the Coastal Zone Act and Shoreline Protection Act.

d. Complete municipal composting plants.

e. Methane gas production for energy as part of sewage treatment facilities.

f. Basing remedial measures on the concept of variable source area.

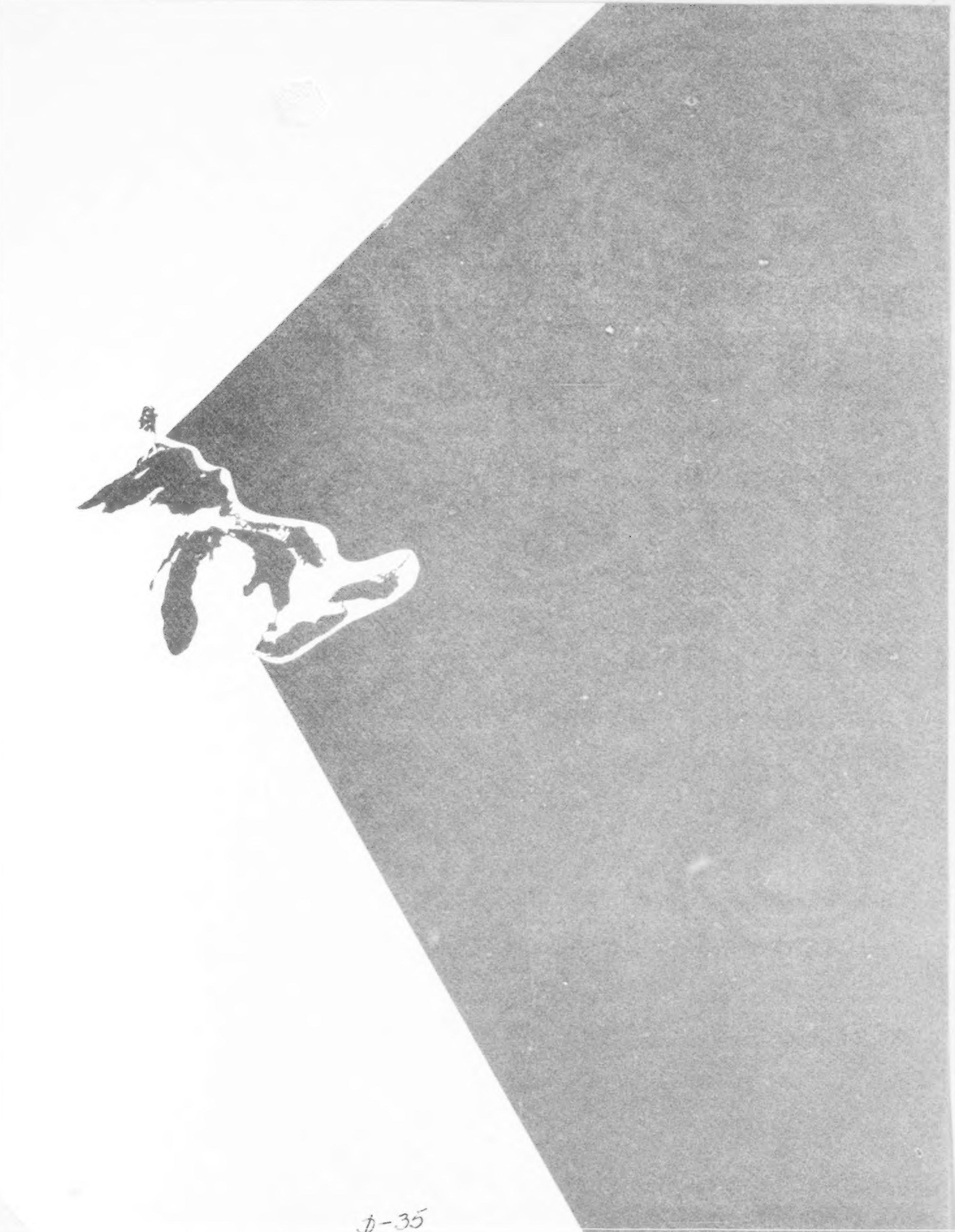
UNITED STATES PUBLIC PARTICIPATION PANEL MEMBERS AND AFFILIATIONS

SOUTHERN MICHIGAN

NAME	AFFILIATION
Phyllis Kruse	League of Women Voters, Director Water Quality
Donna Asselin (alternate for Dr. Dorothy Brooks)	Lake Shore Property Owner's Association, CZM
Peggy Johnson	Clinton River Watershed Council
Russel Gossman	United Auto Workers
James Carr	Attorney, Genesee County, Michigan
Owen Jannson	Huron River Watershed Council
Helen Willis	Panel Chairman, Water Resources Council
Frank Sinclair	Professor, Eastern Michigan University
Katherine Cushman	President, League of Women Voters, Detroit, 208 Planning
John Makris	Detroit Audubon Society
Joseph Neipling	Director of Public Works (Pontiac)
Wayne Schmidt	Michigan United Conservation Clubs
Grace Gluskin	Concern, Inc.
Edwin Shannon	Manager, Environmental Affairs, Dow Chemical Co.
Bill Vanderbeek	Farmer
E.A. Wenner	Michigan Agricultural Conference
Jane Caplitz	Coastal Zone Management

LIST OF APPENDICES

1. Resolution of the Southern Michigan panel supporting the Designation Proposal from the East Central Michigan Planning and Development Region.
2. Designation Proposal, USDA-EPA 208 Model Implementation Project, For The Control Of Agricultural Non-point Pollutant Sources.
3. Charts Showing Source of Pollutants and Their Impact from the Urban Runoff Section of this report.
4. Article entitled "New York Negotiates a Garbage-Fuel Plan".
5. Letter from Governor Milliken in reply to Resolution (see page 6)
6. Comments on the PLUARG background papers.



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REPORT OF THE MINNESOTA PANEL

January, 1978

E-I

I. INTRODUCTION

The Minnesota Public Consultation Panel to the International Joint Commission's Reference Group on Great Lakes Pollution from Land Use Activities was organized and formally met three times during the fall of 1977. The panel was asked to identify the most pressing nonpoint pollution problems facing the Great Lakes, what remedial measures are best suited and most practicable, and how best to implement remedial measures. The eighteen member panel represented environmental, industrial, labor, governmental, educational and citizen interests in Minnesota and northwestern Wisconsin. Participants in the consultation panel's meetings generally found them to be informative and worthwhile. This report was prepared as a result of the panel's meetings on October 3, 31 and November 28, 1977.

A. PANEL'S CHARGE

The panel's role and responsibilities were not clearly established until the second meeting. At the first meeting, the panel members were given the Statement of Work for Panel prepared by PLUARG staff which listed the following responsibilities:

1. The panel will consider the Pollution From Land Use Activities Reference Group (PLUARG) reference, major associated issues and possible remedial measures.
2. The panel will identify for PLUARG remedial action most practical from a social, economic and environmental perspective.
3. Each panelist will attend three meetings; necessary travel costs of panelists will be covered by PLUARG.
4. To the extent possible, panelists will interact with members of the groups which the panelists represent, and other groups and elicit responses.
5. At its first meeting, the panel will elect a chairman to conduct meetings and provide continuity. PLUARG staff will provide support services to keep necessary records on participation and views expressed.
6. Panelists will have access to all available reports and to PLUARG resource people.
7. Each panel will present to PLUARG, a written report by January 16, 1978, stating concerns, findings and the panel's recommendations to PLUARG on remedial measures. If there is general agreement on an issue, or general polarization, this should be noted in the report. The panel is not required to come to consensus on any issue.

8. Each panelist will be asked to evaluate the advisory panel process.
9. Findings and recommendations stated in the panel reports to PLUARG will be published as one volume of the PLUARG technical report series and made available for general distribution.

At the second meeting, the panel, by consensus, narrowed its focus to the following:

1. Identifying critical nonpoint pollution issues.
2. Relating the critical issues to land uses.
3. Developing alternative remedial measures.
4. Evaluating remedial measures by considering economic, social and environmental cost.

The panel focused its efforts to the particular aspects which members perceived to be the most important. Several important issues were not addressed because of the time constraints.

B. FORMAT AND PROCEDURES

The agendas for the first two meetings were prepared by PLUARG staff. Jim Erickson and Karen Carlson were elected to serve as chairman and vice-chairman at the second meeting. The agenda for the third meeting was prepared jointly by PLUARG staff and the chairman.

The panel generally followed Robert's Rules of Order. Alternates of panel members unable to attend were accepted. Non-panel members present were allowed to participate freely in panel discussions.

Ernie Schober of the Soil Conservation Service felt the panel lacked representation from agriculture and Soil and Water Conservation Districts. Bill Aho, Chairman of the Lake County Soil and Water Conservation District, was approved as a panel member at the second meeting.

Discussion of the various issue papers prepared by the PLUARG were limited because of time constraints. The majority of the papers were not made available to the panel until the day of the second meeting which did not lend well to committee discussion. Individual panel member's written comments were sought by the chairman and are included in the appendices.

The panel chairman was chosen to be the panel's representative if any subsequent meeting with PLUARG was necessary.

The panel centered its discussion and developed recommendations during the final meeting on the top six critical nonpoint source issues. The panelists felt that time constraints required them to limit the scope of issues they could adequately address.

II. CRITICAL ISSUES

The panelists were asked to identify five critical water quality issues and note them on paper prior to the first meeting. The following list is the result of the critical nonpoint water quality issues identified by the panel members and under the jurisdiction of PLUARG:

--Erosion and Shoreline

--Atmospheric Inputs (organic, heavy metals, acid rain, etc.)

--Recreation, Planning and Management

--Organic Contamination and Pesticides

--Transportation (Vessel discharge was considered as an issue but was dismissed because it was beyond the scope of PLUARG.)

--Urban Runoff

--Lake Levels

--Mine Land Drainage

--Industrial Site Runoff

--Unregulated Shoreline Development and Unsewered Areas (A panel member suggested inadequate sewage treatment systems as an issue. It was decided that this problem would fall under the overall category of Unregulated Basin Development with the other issues included herein.)

--Forestry Practices

--Agricultural Practices

--Solid Waste Management

--Dredge Spoil Disposal

--Wetlands Protection (including groundwater)

--Construction Activities

--Hydrologic Manipulation

Radioactive material use and storage were identified by the panel to be a critical potential source of pollution to the Great Lakes. Radioactive material was not included in the critical issue list because it was not under PLUARG charge. The panel requested PLUARG staff to update them on what efforts are currently being taken to address this issue in the Great Lakes Basin. The panel felt that greater efforts are needed to properly address this potential source of pollution to the Great Lakes.

The critical issues identified were prioritized at the second meeting. Concerns were expressed that all issues identified were important and merited discussion and there was really no need to prioritize. The panel chose to prioritize issues in order to concentrate its limited time on the most critical issues. The following, in order of priority, are the panel's top six issues:

1. Basin Development (unsystematic basin development)
2. Hydrologic Manipulation
3. Erosion and Shoreline
4. Atmospheric Inputs (organics, heavy metals, phosphates, acid rain, etc.)
5. Urban and Industrial Site Runoff
6. Agricultural Practices

III. CRITICAL ISSUES, LAND USES AND REMEDIAL MEASURES

The critical issues that were identified and prioritized were discussed as they relate to specific land uses and remedial measures at the last meeting. Because of limited time, only the top six issues could be addressed. The panel divided into two groups to address the issues in a more time-efficient manner. Each sub-panel reported its findings and recommendations to the full panel.

Each critical issue identified was first analyzed to determine its relationships to various land uses and lesser issues to better understand the problem. Alternative remedial measures were then listed as means to control the source of the non-point water pollution. The recommended remedial measures were endorsed by the full panel.

A. BASIN DEVELOPMENT

Basin development, or in more specific terms, unsystematic activities of man within the basin, received the greatest attention from the panel because of its far-reaching scope of concerns. It was one of the most difficult issues with which the panel dealt. The following describes the process by which the panel arrived at its recommendations.

Land Uses and Issues. The panel recognized that there were six major land and water uses that had some impact on the system's water quality.

a. Urban and Rural Settlement

b. Navigation (harbors, navigational aides, etc.)

c. Hydroelectric Power

d. Fish and Wildlife

e. Water Supply

f. Industrial, Mining, Wood Products Harvesting and Processing, Agriculture, Land Transportation and Nuclear and Fossil Fuel Power Generation

Working under the assumption that there were at least two basic basin goals with which most everyone could agree (1) clean, useable water and (2) maintenance and enhancement of the existing quality of life, the panel then went through a process of identifying the responsible agencies for any remedial action that might be enacted. It was soon clear to the panel that responsibility is in the hands of a multi-level maze of local, state and federal agencies. To understand what can be done, the panel first wrestled with implementation responsibility as follows:

--Federal/International Level. An umbrella of federal laws dictates to a great extent what federal agencies may do and which one does what. For example, the Clean Water Act (PL 92-500), the Clean Air Act, various navigation acts, Hazardous Wastes Act, Coastal Zone Management Act, various forest management acts, etc. The various acts stipulate whether the Environmental Protection Agency or Corps of Engineers has jurisdiction such as in PL 92-500. NOAA, HEW, HUD, EDA, etc. are all involved in implementation depending on the law.

--State Level. States for the most part have their own counterpart for federal implementing agencies. States exercise somewhat more authority than federal agencies in the areas of water rights and appropriations, public health and in some states, shoreline management activities.

--Local Level. In terms of land use control and potential remedial measures, it is at the local level where all the action or inaction occurs. It was the consensus of the panel that if anything is done in orderly land use planning and development, it is going to be local government that does it, whether it be the county, city, district, or township. These governmental entities are immersed in the day-to-day decisions concerning zoning, public health, water supply provision, wastewater treatment, solid waste disposal, transportation network development, erosion control, shoreline management and comprehensive city-county planning.

Summary of Discussion. The panel, during its deliberations, evaluated the system of authority in which land and water decisions are made, in view of the two basin goals, to identify recommended remedial measures. These recommended measures were developed in full recognition that implementation will require a different sense of direction than the current PLUARG program.

Remedial Measures. The panel developed four remedial measures that members believe respond to their definition of the critical issue of basin development:

a. Recommended Remedial Measures

--To develop an organized resource information system which would provide knowledge of legal, institutional and programmatic aspects of the multi-level governmental system that applies to our Great Lakes, and to include development of a delivery mechanism to the citizen-user.

--To utilize appropriate basin-wide cost/benefit studies for initiating new programs or projects in the basin.

--To initiate a program non-proliferation pact recognizing sufficient programs exist to deal with water quality issues. When new solutions are required, we should build upon existing programs.

--To organize local and state comprehensive planning programs by articulating basin-wide guidelines and goals in all aspects of air, water and land use.

b. Other Remedial Measures

--One suggested remedial measure that the panel did not support consisted of a recommendation to develop a growth policy by establishing a basin carrying capacity.

B. HYDROLOGIC MANIPULATION

Land Uses and Issues. The following issues were considered to relate to hydrologic manipulation.

a. Maintenance of Artificial Lake Levels

b. Drainage of Wetlands

c. Disproportionate Influence of Urban Areas in Hydrologic Manipulation

Summary of Discussion. Decisions in setting lake levels appear to be made without evaluating the true cost to Lake Superior, its industry and environment. High water levels in Lake Superior contribute to erosion and to the degradation of the lake via transport of polluted material, pesticides, chemicals, metals and toxic material. High water levels may result in loss of property to individuals, corporations and municipalities as well as loss of valuable wetlands. Some of these problems will occur naturally, but proper studies are not made and the decision to maintain certain levels continues to lack validity since no encompassing plan is apparent to the public.

Wetlands are recognized as important contributors to filtering water and reducing sediment loads. Wetlands drainage or filling for development destroys the natural function of the wetlands. Destruction of wetlands throughout the basin contributes to increased loading of heavy metals, chemicals and pesticides into the lakes.

Heavily urbanized areas have greater political influence in decision making. In the setting of lake levels, responsible agencies appear to have made decisions based on the needs of the Lower Lakes without evaluating fully the costs to the Upper Lakes, Lake Superior in particular. This disproportion extends to other forms of hydrologic manipulation as well.

Limited information on groundwater recharge and discharge is available. What contributes to groundwater degradation and what can be done to assess, preserve and protect groundwater supplies.

Remedial Measures.

a. Recommended Remedial Measures

--Require environmental impact assessment throughout the basin before permitting wetlands alternation (not necessarily an environmental impact statement.)

b. Other Remedial Measures

--Formalize decision making process regarding any form of hydrologic manipulation and evaluate benefits and costs to a) individual lakes and areas and b) total basin.

--Formalize lake levels decision making processes, considering benefits and costs for a) total basin and b) Lake Superior.

C. EROSION AND SHORELINE

Land Uses and Issues. The following uses were related to erosion and shoreline.

a. Forestry

b. Urban Development

c. Lake Levels

d. Agriculture

e. Extractive

f. Transportation

g. Construction

h. Recreation

Summary of Discussion. Nearly all of man's activities in the basin are included in this broad category and these activities contribute to degradation of the lakes through increased and uncontrolled runoff, additional sediment loading and contributions of heavy metals, pesticides, chemicals and toxic material.

Restricting clear-cutting in potentially high erosion areas, limiting timber operations and roads within an established distance from lakes and streams, protecting and using natural drainage systems and mandating revegetation were possible mitigating measures for forestry problems. A workable system of controlling all activities within the basin will be a balance of 1. restricting activities, thus allowing the natural system to continue, and 2. mitigating measures once the natural system has been changed or destroyed. Again, decisions in regard to development/no development appear to be made without a full evaluation of the costs and benefits to the total lakes and to individual areas and lakes. The need to protect aesthetic values, for their own sake, as well as to enhance recreation and tourism, a major industry around the relatively still unpolluted lakes, is not properly weighted in the decision making process. A system which gives an acceptable "weight" in the process to all benefits and costs is needed.

Remedial Measures

a. Recommended Remedial Measures

Where none exists, legislation be enacted requiring permits for all "new surface disturbances of x number of acres" with the possibility of some categorical exceptions. Such legislation should be:

--enforced, if possible, by counties, as in the plan developed in the state of Michigan.

--funded to handle administrative costs.

--implemented through a simple permit system (possibly one coordinating unit).

b. Other Remedial Measures

None.

D. ATMOSPHERIC INPUTS

Land Uses and Issues. The following uses were related to atmospheric inputs.

a. Power Plant Sitings

b. Transportation

c. Mining/Smelting

d. Agricultural Practices
   1) pesticides (contaminants)
   2) fertilizers (nutrients)
   3) Tillage (sediment)

e. Solid Waste Management Practices

Summary of Discussion. Knowledge of atmospheric transport and eventual deposit of pollutant material is in the very early stages of study. More encompassing studies, including information regarding transportation within states, across state boundaries, as well as across international boundaries, are essential.

Remedial Measures

a. Recommended Remedial Measures

--Study current U.S. and Canadian legislation regarding air pollution and assess its effectiveness.

--Increase public awareness of atmospheric pollution's impact on water quality.

--Study current sources and loadings of atmospheric pollution on an international basis.

--Develop and enforce "adequate" international air pollution control measures.

b. Other Remedial Measures

Development of a "systems" approach to evaluating costs/benefits to society of any activity, with all activities weighed in terms of cost, was discussed. Such systems presently exist and should be explored as a tool in the decision making process.

E. URBAN AND INDUSTRIAL SITE RUNOFF

Land Uses and Issues. Urban and industrial runoff affects or is affected by:

a. Storm Sewers

b. Impervious Surfaces in Urban Areas

c. Construction Practices

d. Transportation

e. Other Activities

Summary of Discussion. Urban contributions to accelerated changes in the lakes are and will continue to be a serious problem and a priority item. Storm sewer contributions to the Great Lakes during periods of high runoff include sediments, oxygen demanding substances (BOD and COD), nutrients (phosphorus and nitrogen), arsenic and trace metals, (lead, zinc, cadmium, chromium, copper, iron, nickel, mercury and strontium), organic chemicals (oil, grease, phenols, PCBs, pesticides and herbicides), salt, asbestos and bacteria. Far reaching changes in life style may be necessary to control degradation from the urban areas around the Great Lakes. The use of the individual automobile was cited as something which might have to be changed and the difficulty and time required to make such changes in the general population were discussed.

Remedial Measures

a. Recommended Remedial Measures

--Review literature, where it exists, regarding storm sewer outlets, and sample and list storm sewer outfalls where not previously sampled.

--Set and enforce storm sewer outfall standards for substances listed in discussion.

--Establish "greenbelts" and other non-structural systems to control and treat runoff in urban areas.

--Control runoff from construction sites through development of new building/construction codes.

b. Other Remedial Measures

Enforced maintenance of all motor vehicles by the states to control emissions.

F. AGRICULTURAL PRACTICES

Agricultural practices were viewed by the committee as having little significance in the Lake Superior Basin at present but, depending on national policies, both programmatic and fiscal, agricultural practices could become a higher priority issue.

Land Uses and Issues. The panel identified nine areas that impacted the agricultural issue.

a. Land Productivity

b. National Farm Policy

c. Farm Organizations

d. Irrigation (ground water mining)

e. Transfer of Water outside Great Lakes Basin

f. Erosion

g. Agricultural Zoning relative to losing prime agricultural land to urban development

h. Drainage Policies.

Summary of Discussion. The panel evaluated the issue of agricultural practices by identifying which level of government could implement what remedial measure. While all recommendations are not land specific, the policy implications should be heeded.

Remedial Measures

a. Recommended Remedial Measures

--Agricultural runoff should be addressed locally following state guidelines. Cost-sharing should be used as an incentive in local implementation. Research and development needs still remain in analyzing agricultural runoff problems on water quality.

--Land productivity was felt best implemented at the local level in response to state and federal farm objectives.

--National Farm Policy is a federal level responsibility and consequences of such policy relating to exports, balance of payments and effects of international markets should be viewed with their effects on marginal land utilization by farm producers. Utilization of these marginal lands for agriculture has far greater impacts on water quality.

--Irrigation should be regulated by the state within basin-wide guidelines with an objective of not allowing ground water mining. Regulations should be reviewed at the local level.

--Erosion has been and continues to be one of the major water quality degradation factors. Remedial measure responsibility crosses federal, state and local boundaries. However, implemented remedial practices such as cost-sharing, technical assistance, systems planning, and regulations and ordinances should be implemented at the local level in response to federal and state guidelines.

--Agricultural zoning can help keep prime agricultural land in production along with the use of tax incentives, green belts, and open space design in urban areas.

--Drainage of wetlands is a major concern primarily because of lack of a national policy (basin-wide) with state and local responsibilities should be initiated.

b. Other Remedial Measures

--Two areas concerning farm organizations and transfer of water outside the Great Lakes Basin did not receive panel support in terms of recommended remedial measures. It was suggested that the federal government recognize collective bargaining by representative farm organizations as a vehicle to get farmers to self-regulate their own practices. Little comment was made concerning transfers of water outside the basin.

IV. SUMMARY

The panel reviewed and discussed many issues and activities related to non-point source water pollution of the Great Lakes Basin. Throughout the panel's efforts, it was difficult to divorce our Lake Superior bias for the total Great Lakes Basin view. However, the majority of the concerns expressed by the panel is applicable throughout the Great Lakes Basin. The summary will focus on general panel reactions and concerns expressed in the three meetings. Specific comments and concerns relating to the critical issues identified can be found in Sections II, Critical Issues; and III, Critical Issues, Land Uses and Remedial Measures.

Panel member concerns over the panel's role were obvious throughout the three meetings. Some of the panel members in attendance at the first meeting did not bother to attend the following meetings. Information materials supplied by PLUARG staff were often given out at the meetings; thus little or no opportunity was possible for serious panel review. Panel members who did attend all three meetings did so under the belief that they were serving as an advisory panel to PLUARG and not as a means to gain local support.

The lack of available information of the Great Lakes System was apparent from the issue papers presented. There is considerable need for continued research in various areas such as atmospheric loading and transfer. Final PLUARG recommendations should reflect the degree of certainty of the information that was used to develop them.

Further PLUARG efforts should also address potential sources of pollution that may develop in the future. Preventive activities today may lessen the chance of serious problems in the future. For example, the storage of radioactive wastes within the Great Lakes Basin poses a potential hazard to the water quality of the basin. Several areas within the Minnesota portion of the Lake Superior Basin are presently being investigated as a possible storage site for radioactive wastes. The potential water quality impacts related to storage, transportation and use of radioactive materials on Lake Superior, the headwaters of the basin, should be carefully addressed by the IJC.

The panel spent considerable time discussing remedial measures philosophies. Generally, they felt that the costs for remedial measures should be internalized as much as possible. An activity that is causing a non-point source of water pollution should be assessed by the cost of mitigating the problem. However, at the same time, certain activities causing non-point sources of pollution will require financial assistance or incentives to clean up. It was the consensus of the panel that the entire range of costs and benefits (environmental, social, economic) must be weighed in considering any remedial measure applied to a problem.

The panel had serious concerns over the "Evaluation of Remedial Measures to Control Non-Point Sources of Water Pollution in the Great Lakes" document offered by PLUARG for their review. This document strongly favors the structural approach to control non-point sources of pollution. The panel felt that numerous non-structural alternatives must also be developed.

The panel felt that since the Great Lakes are one system, there should be some consistent basic standards and guidelines throughout the Great Lakes Basin. Water quality standards for one particular lake, such as Lake Superior, should be uniform from one jurisdictional boundary to another within the same lake basin. However, the panel also felt that water quality standards for the Great Lakes Basin should be adjusted for particular unique characteristics of individual lakes. For example, for Lake Superior, the headwaters and largest lake in the Great Lakes System, a discharge standard for any one particular pollutant may or may not have to be more stringent than for Lake Erie. The panel felt that different nearshore and offshore water quality standards would be acceptable as long as they were consistent within the particular lake basin.

Throughout the panel's discussions, the need for basin-wide analysis of major governmental or private sector actions having impacts on water quality was echoed. These analyses must consider environmental, social and economic concerns and be presented in a manner which enables close public scrutiny. If value judgements and assumptions are used in an analysis, they should be identified along with their degree of confidence. Opening up the decision making process allows citizens to exercise their rights to determine what the water quality of the Great Lakes will be.

In conclusion, the panel members all recognized the importance of the role Lake Superior and the Great Lakes System play to some degree in all our lives. We all utilize the lakes to some degree for a variety of uses. The maintenance of an acceptable level of water quality for the Great Lakes is needed to maximize benefits to society today and maintain options in the future.

UNITED STATES PUBLIC PARTICIPATION PANEL MEMBERS AND AFFILIATIONS

MINNESOTA

NAME	AFFILIATION
Lois Kundel	Duluth Port Authority
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Joseph Nosek	Chairman, Lake County Planning Commission
David Peterson	Director of Duluth Water & Gas Department
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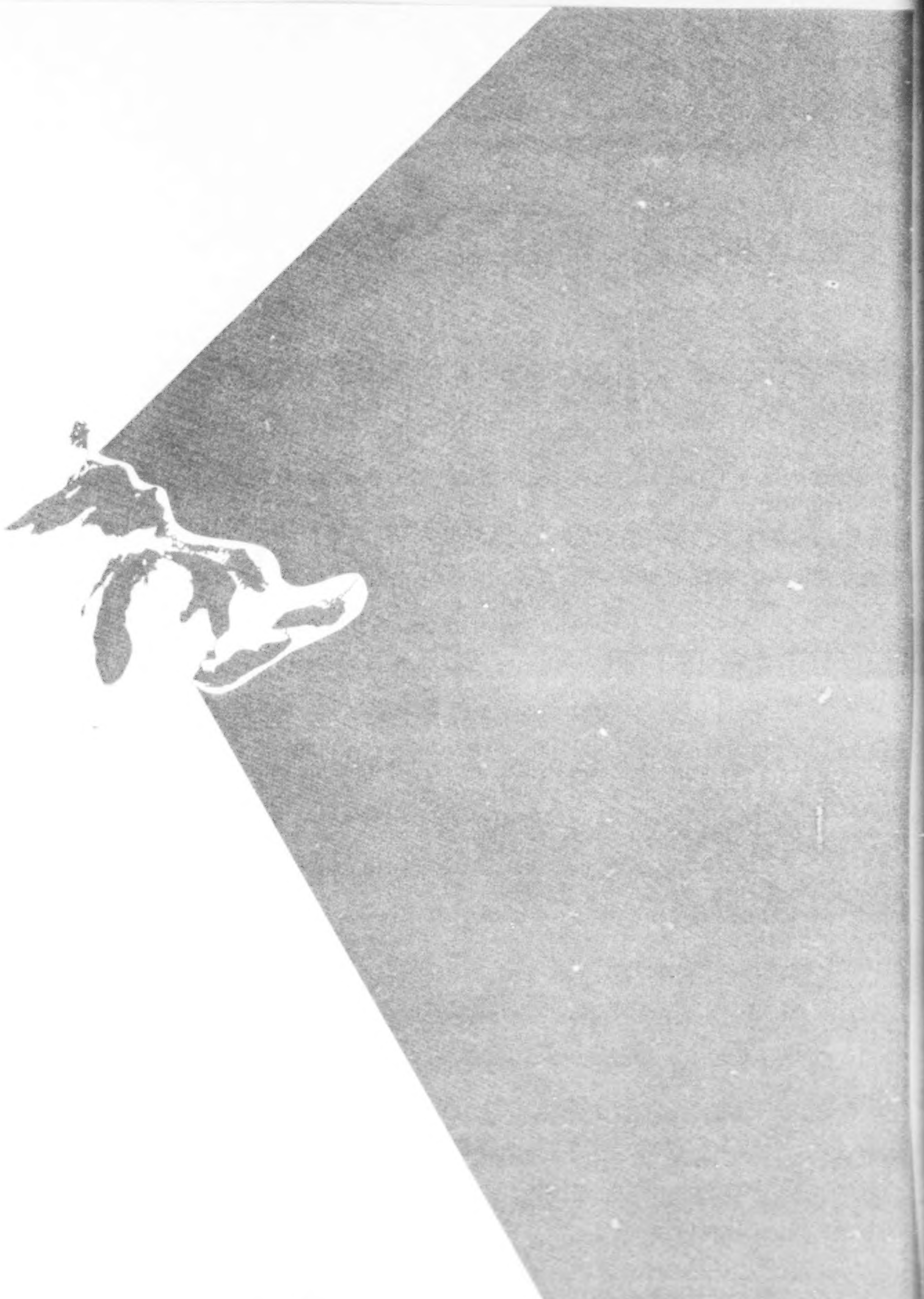
Michael Link	Director, Northwoods Audubon Center
Stephen Berguson	Environmental Engineer, Minnesota Power & Light Company
Robert Poppe	Project Director, Copper-Nickel Task Force
David Zentner	Banker's Life Company
Tom Klein	Sigurd Olsen Institute, Ashland College
Betty Hetzel	League of Women Voters
W.G. Opsahl	West Lake Superior Sanitary District

LIST OF APPENDICES

1. Minutes of first, second and third panel meetings.
2. Individual Comments on PLUARG background papers.
    a. Extractive Areas (mining)
    b. Shoreline Landfilling
    c. Deep Well Disposal
    d. Transportation
    e. Solid Waste and Sewage Sludge Disposal
    f. Recreation
    g. Urban
    h. Shoreline and Riverbank Erosion
    i. Agriculture
    j. Forestry
    k. General Commentary
    l. A Review of PLUARG Studies



REPORT OF THE
NEW YORK
PANEL

January, 1978

F-I

INTRODUCTION

The New York Consultation panel was formed to advise PLUARG and, through them, the IJC on what are perceived to be the major problems of non-point source pollution within New York State that affect the water quality of the Great Lakes. Further, the panel was asked to aid in developing a remedial philosophy that would point toward practical and socially acceptable methods of dealing with these problems. Through a series of three meetings and numerous writing sessions, the panel has evolved its response.

The first action by the panel was to ascertain what its members felt were the predominant causes of pollution from non-point sources occurring within the New York portion of the Great Lakes Basin. After discussions among the members and with groups and individuals outside the panel, a rank order of the seven highest priority problems in the region was developed.

1. Toxic Substances
2. Landfills/Waste Disposal
3. Urban Runoff/Combined Sewer Overflow
4. Air Pollution
5. Agriculture Runoff
6. Construction
7. Erosion/Sedimentation

These seven priority problems were the focus of discussion for a portion of each meeting. A definition of each problem, as perceived to the panel members, was developed. Subsequently, the panel formulated answers to the question on remedial philosophy posed by PLUARG and put together its recommendations on each of the priority problems. Individuals volunteered to pull together all discussion and written material and to develop a single report on each priority problem that expressed the collective views of the panel.

Over this same period, the panel examined each of the position papers on non-point source pollution presented by PLUARG. Panel members were asked to write their comments concerning these papers. The papers were also discussed at the later meetings. Summaries of these comments and discussions are also a part of this report.

If the public is going to be asked to support abatement programs involving non-point as well as point sources of pollution, it must be with a goal in mind. The panel members considered what their aspirations were for the future of the Great Lakes. They listed 12 conditions and uses for the lakes they would expect if the programs were effective.

1. Swimming
2. Fishing
3. Potable Water
4. Support for Regional Economics
5. Weed Free
6. Positive Aesthetics
7. Invaluable Inheritance
8. Resotration
9. Transportation
10. Boating/Marinas
11. Effluent Free
12. Wildlife

This report, as much as possible, represents a consensus of the opinions of the panel members. The members, of course, are from a variety of backgrounds and interests. To assure that the views of all members are available to PLUARG, all written comments received by the panel have been appended to this report.

In summary, the panel felt strongly that all the non-point source problems reflect a need for public education as to what the problems are and what the public can do to help alleviate them. In addition, there is a further need to educate and train those individuals, groups, agencies and governments who are most directly connected with the various causes of non-point source pollution. In a number of cases, progress can be made towards abatement by providing information on corrective measures that can be undertaken. Also, abatement will require a financial commitment on the part of all levels of government to provide remedial measures and, where necessary, enforcement.

PRIORITY PROBLEMS

TOXICS

The panel identified seven major areas of concern for PLUARG and ranked these in order of priority. The issue of toxic substances was identified by the panel as posing the major leading problem in the basin. Toxic substances cross cut the issues of air pollution, landfills, waste disposal and urban runoff. The concern for the ubiquity of these compounds is reflected in the panel's assignment of the highest priority to this problem.

The pervasiveness of toxic compounds in the environment is a result of surging industrial growth in both the United States and Canada over the past few decades. There has been an increasing dependence by our society upon plastics, synthetic fibers, pesticides, and a variety of other petrochemicals to make our lives easier and more convenient.

The benefits realized through the use of these new compounds, however, are not without their drawbacks. There is mounting scientific data establishing the link between increased cancer mortalities and the widespread occurence of these compounds in our air, food, and water. Concer is presently the second leading cause of death in the United States, accounting for the premature death of approximately 1,000 people per day. Estimates by the World Health Organization and National Cancer Institute have concluded that from 60 percent to 90 percent of all human cancers are environmental in origin. The increase seen in cancer mortality since 1900 is far above the gain expected either from the general population's increased life expectancy or the decrease of other leading causes of premature death, such as infectious diseases. Nine separate epidemiological studies performed independently have demonstrated significant associations between consumption of these compounds in drinking water alone and increased gastro-intestinal and urinary tract cancer mortality.

Many of these substances are also non-biodegradable, have very long lives in the environment, and exhibit bioaccumulative effects. Some exhibit sublethal effects by inhibiting reproductive rates or reducing reproductive success, and some are directly lethal to fish and wildlife.

Toxic substances are introduced into the environment by a variety of means. In most instances, the ultimate fate of toxics is deposition in the water environment. Major non-point modes of transportation include, but are not limited to, leachate from landfills, air pollution through incomplete incineration, runoff from storm events in paved areas, and areas under construction, inappropriate application of pesticides, contamination from waste disposal sites, and reintroduction of toxics into the water column through contaminated dredge spoils. The problem, as framed for PLUARG by the panel, is to bring the unregulated proliferation of toxic substances under control to prevent the introduction of these compounds into the Great Lakes, and to develop safe, intelligent alternatives for coping with their ultimate fate and disposal in a manner that is environmentally sound and compatible with long term goals.

The panel was asked to respond to 4 questions posed by PLUARG with respect to toxics. First, should remedial measures be equally administered throughout the basin? The panel felt the answer was yes, that remedial measures could only be effective in the presence of strong, basin-wide administration. It was the feeling of the panel that at least part of the problem with toxicants was due to inadequate and capricious enforcement of current laws.

Second, who should pay the cost for remedial programs? The panel felt that the producer, disposer and user should shoulder the burden, and that the primary responsibility should fall upon the source of the material and the user.

Third, at what level of government should implementation occur? There was a split decision on this issue by the panel. The majority felt that implementation of control and remedial measures should be at the local level, with backup and enforcement at either the state or federal level. The minority felt that all aspects of implementation should be at the state or federal level. The issue in question was the effectiveness of local government vs. federal government implementation and the susceptibility of each level of government to special interest groups. No consensus could be reached.

Fourth and last, is enforcement necessary, or are voluntary measures sufficient? The overwhelming sentiment of the panel was that enforcement was mandatory. Voluntary measures were held to be untenable for the purposes of enforcing toxic substances remedial measures.

The panel did not feel that it was appropriate to delineate specific strategies for dealing with the problems outlined, in that more information on the contributing effects of air pollution, runoff, etc., was still coming in, and that policy decisions should be rendered only at inclusion of this information. The panel felt strongly that the disposal of these compounds has to occur in such a way as to prevent their reintroduction into the air, water, and soil. Landfilling and low temperature incineration were judged unacceptable approaches to the elimination of toxic substances. The panel felt that research efforts and policy decisions should be directed towards decomposition of these chemicals into non-toxic components or byproducts. The panel expressed a desire for more research in the areas of the environmental fate of these compounds, and for stricter controls over the production, storage, transportation, use, and disposal of toxicants. One suggestion put forth included "cradle to grave" registration of toxic substances. It was felt that PLUARG should pursue an aggressive course of action in preventing the introduction and proliferation of these compounds in the Great Lakes Basin.

LANDFILLS/WASTE DISPOSAL

The PLUARG panel members consider problems associated with waste disposal in landfills second in priority to toxic substances. Indeed the problem of toxic substance movement from chemical and sanitary landfill into the Great Lakes and its tributaries poses a most serious long term threat to the lake ecosystem and its use as a water supply for basin inhabitants. Movement of PCBs and other chlorinated hydrocarbons from abandoned chemical landfills into Great Lakes tributaries in Niagara Falls and Oswego, New York and even from sanitary landfills in Ontario have been documented.

Because of their highly toxic and/or persistent nature, many chemical wastes are of most concern in land disposal environments of the Great Lakes Basin. Examples are heavy metals and chlorinated hydrocarbons. Municipal solid waste generated from residences and commercial establishments is generally nontoxic but can release higher than desirable levels of chlorides, sulfates and other salts to groundwaters and surface waters in unsatisfactory disposal environments.

To the extent possible, resource and energy recovery from urban solid waste should be practiced in preference to disposal on land. Serious consideration must also be given to mandatory incineration of toxic and persistent organic wastes rather than land disposal even in steel drums. Leakage from corroded steel drums occurs after many years.

The panel recognized that through the Resource Conservation and Recovery Act of 1976 (RCRA) the United States government is attempting to foster increased energy and resource recovery from solid waste. In addition, a system of registering and tracking toxic and hazardous wastes from point of generation to ultimate land disposal is being developed. Detoxification, use of impermeable liners and other measures will be used to ensure protection of ground and surface waters from toxic chemical contamination. The panel recommends special efforts and obligations of funds by United States and Canadian environmental officials to ensure that toxic and persistent chemicals from existing and abandoned landfills do not enter Great Lakes waters or their tributaries.

Panel members concurred that needed remedial measures for landfill/waste disposal should be equally administered throughout the Great Lakes Basin. This will prevent landfilling in less restrictive areas to avoid costs of adequate ground and surface water protection.

The panel felt that the costs of remedial measures should be paid by the source of the waste. The federal government should aid in resource and energy recovery programs wherever possible, and also in promotions such as returnable beverage containers.

Implementation and administration of solid waste/recycle programs should be at the local level (town or county) with enforcement at higher levels (state, federal). Regulations designed for ground and surface water and public health protection, associated with landfilling, must be enforced to be effective.

URBAN RUNOFF/COMBINED SEWER OVERFLOW

It is the position of the New York PLUARG panel that urban runoff in the form of combined sewer overflows and stormwater discharges represent a significant water pollution problem in the Great Lakes Basin. The runoff from urban areas contributes significant quantities of heavy metals (Pb, Cd, Hg, Zn, Cu, etc.), sediment and other suspended solids, biochemical oxygen demand, macronutrients (phosphorus, nitrogen and carbon), bacteria, viruses, chlorinated organics, pesticides, herbicides and a range of other toxic substances.

Of particular importance is the first flush associated with the initial scour of surface and conveyance system contributed pollutants. The first flush of urban runoff can create short term toxic effects in receiving waters as well as contributing to a contaminated benthos. In a number of locations in the Great Lakes Basin, the use of beaches (proximate to urban areas) for contact recreation is restricted due to the contamination of nearshore waters by indicator organisms contributed by stormwater and combined sewer overflow discharges.

The New York State PLUARG panel majority opinion holds that there should be uniformity across the basin in the administration of remedial measures. It was also the majority opinion that remedial measures be applied with consideration of local problems and objectives. A minority opinion held that the administration of remedial measures be made on an as-needed local basis.

It was the New York PLUARG panel majority position that the cost of the defined remedial programs be covered by a combination of federal, state and local means. Minority opinions ranged from complete federal support to complete local support. It does appear that remedial measures involving zoning of green bands, the promotion of natural drainage, the application of porous pavement, and the effective application of street cleaning and collection system maintenance lie within the domain of local determination and financial support. If it is determined that capital intensive programs involving storage and treatment are necessary, federal and state financial support will likely be necessary.

The majority position held that the implementation of remedial programs should be at the local level with enforcement conducted at a higher level. Minority opinions included enforcement at the county level as opposed to enforcement at the state or federal level. It was primarily the unanimous opinion that implementation of abatement programs be conducted at the lowest level of government. It was also widely held that enforcement is necessary, although a number of the panel members felt that existing legislation could provide the vehicle for future enforcement.

There does appear to be a need for better definition of the impact of urban runoff on receiving water quality. Particular emphasis might also be placed on cost/effective measures to deal with the problem. Zoning restrictions should consider the impact of runoff from large expanses of highly impervious surfaces and give consideration to the application of natural drainage concepts to reduce the intense hydrologic and hydraulic loadings.

In the case of combined systems operation and maintenance, grants from state and federal agencies might be considered to insure that existing regulators, diversion structures, and control structures are well maintained and regularly tuned to maximize the utilization of existing hardware. Only after the existing conveyance/storage/treatment facilities are optimized should the investment of major capital programs be instituted. The application of best management practices relative to the control of urban runoff should be encouraged.

AIR POLLUTION

Air pollution was identified by the panel as the fourth leading non-point problem in the Great Lakes Basin. Air pollution affects the water quality of the basin by means of precipitation and deposition which redeposit particulates either to the water directly, or onto land drained by the basin. Compounds of interest include phosphorus and sulfur, and a wide variety of toxic substances including, but not limited to, PCBs and lead. The main sources of phosphorus include organic debris, dust and industrial activity.

Sulfur is contributed to the basin in the form of both sulfates and sulfur dioxide. Some data indicate that the major sources of airborne sulfates in the Great Lakes Basin may extend well beyond the basin area into the Ohio River and Mississippi River regions, where southern air masses pick up and transport sulfates for deposition in the lower Great Lakes Basin. The deposition of sulfur dioxide, on the other hand, seems to correlate with local air emissions, and regional pollution serves as the primary source of this sulfur species.

The primary source of airborne lead is automobile emissions. A significant fraction of the lead loadings in the basin is thought to originate from long distance transport.

The atmospheric sources of PCBs are thought to include incomplete incineration of refuse containing these compounds, and evaporation from plasticizers, preservatives, and lubricants. Other toxic substances are believed to be introduced into the Great Lakes Basin in a similar manner.

Compounds deposited on land can be reintroduced into the water environment through the processes of erosion, leaching and runoff. Upwards of 70 percent of the total lead in Lake Erie and 40 percent of the total PCBs in Lake Ontario are thought to result from atmospheric loadings, implicating air transport and deposition of pollutants as a major vehicle for the introduction of specific pollutants into the basin. The problem for PLUARG, as defined by the panel, is to arrive at measures to control both the introduction of problem pollutants into air and the subsequent increased loadings to the water environment and land within the drainage area.

The panel was asked to respond to four questions posed by PLUARG with respect to implementing remedial measures. First, should remedial measures be equally administered throughout the basin? The panel felt strongly that remedial measures should be imposed equally throughout the basin and extended to that area outside the boundaries of the basin necessary to accomodate sources that affect water quality in the Great Lakes but were situated outside of the area in question. The panel felt that the severity of the problem could conceivably warrant imposition of stricter air pollution standards to other regions of the country for the purposes of safe-guarding water quality in the Great Lakes, and urged that PLUARG advocate such regulations as necessary.

Second, who should pay for remedial measures? The panel agreed that the major cost of remedial measures to control air pollution should be borne by the source of the problem. In deference to a worsening economic situation, the panel felt that there should be federal relief in some form for that to be feasible. The panel recommended that PLUARG explore the options of tax incentives, grants, and low interest loans to implement remedial measures for point sources. The panel did not suggest any "best" strategy for actualizing its recommendations.

The third question asked of the panel was at what level of government should remedial measures be best implemented? The panel felt that implementation should be at the lowest governmental level possessing the technical capability to do so. This statement resulted from a discussion regarding the treatment of large polluters versus small polluters, and whether a large polluter could be adequately handled by local agency officials. The question also arose as to whether a federal agency should get involved with small scale burning operations, such as the incinerating of leaves in the backyard. The panel felt that small polluters could be best handled at a local level, and that larger polluters should come under state or federal regulation.

The last question dealt with whether voluntary measures would be sufficient to implement remedial measures, or whether enforcement would be necessary. The panel felt overwhelmingly that voluntary matters would not be enough, and that a mandatory enforcement program would be needed.

The panel did not offer any specific recommendations for dealing with the high atmospheric loading of specific pollutants into the Great Lakes. There were suggestions that the scope of current research efforts be expanded to include atmospheric contributions of polynuclear aromatic hydrocarbons, phthalates, cadmium, zinc, asbestos, and various other toxics. The panel defined a need for more substantive information regarding the actual contributions atmospheric sources provided to the basin for different compounds, the modes of transport and delivery, and identification of the origins and sources of various atmospheric pollutants. The panel felt it inappropriate to comment on remedial strategies in the absence of this information.

AGRICULTURAL RUNOFF

In the polling of our committee, agricultural runoff is given a priority rating of five in a list of seven.

In general, in New York State soil loss from erosion and sediment is the greatest single water pollutant from agriculture activities. To what extent this effects the waters of the Great Lakes is difficult to determine since all sediment does not reach the lake. Agriculture activities contribute nutrients to the streams of the Great Lakes Basin. Runoff water from agriculture land may increase the dissolved phosphorus,but we do not "have a handle" on how much becomes dissolved and therefore available when it actually reaches the lake.

There is some indication that farmers are over fertilizing,particularly in the use of phosphorus. There is a need for a continuation of our on going educational program to inform the agricultural community in the use of soil analysis and soil type and to follow recommended fertilizer application rates for the crop to be grown.

The spreading of animal waste on frozen land, particularly in areas close to streams and steep slopes where eventual runoff may reach a stream, makes a nutrient contribution and is a practice which may have to be approached with approved manure storage in problem areas.

Pesticides in New York State have a low level of effect in harming the environment. New York State law requires registration of all pesticides distributed, sold, transported and applied in the state. The Pesticide Applicators Law stipulates that any person who is engaged in custom application of pesticides must be certified by the Department of Environmental Conservation. Certified applicators are required to participate in a training program. The Department of Environmental Conservation carries out normal inspection and spot inspection of commercial and private applicators.

Feed lot operations have not posed a serious water quality problem in New York State; however, since historically farmsteads were often built near a stream or in fact, barn on one side and house on the other, we may find it more of a problem than heretofore thought. For example, unconfined animal operations, where significant water quality problems are apparent, should provide for limited access to streams and ponds through proper location of waterers and feeders and the use of fencing, trees or artificial shelter.

As New York State landowners continue to comply with the Conservation Plan Law, the planning process and recommended best management practices provided by the soil and water conservation districts should point out the problem areas and the approach to correcting the problem. Many of the conservation practices landowners have been applying in the sense of stopping soil erosion will apply as well to water quality.

As state-wide 208 planning becomes a reality, we should be in a good position to identify problem areas and establish priorities for correction.

Sediment is the primary and most easily controlled constituent of agriculture runoff. The Conservation Farm Plan will identify the measure to be taken. This would depend on the kind of agriculture being carried out, soil type and etc. Cost-sharing will by necessity vary depending on type of pollution. At this time, landowners are required by law to make application to their county soil and water conservation district for a plan. Once application has been made, the district must provide the plan with a review process by the district board every five years. The planning process plus the implementation of practices will necessitate increased funding to soil and water conservation districts for technical expertise.

New York State is on the way toward identifying agriculture and non-point runoff. The implementation of corrective measures will take time. Some will be accomplished voluntarily by the individual, some by cost-sharing, for example, the Agriculture Conservation Program sponsored by the federal government. Other and more costly control measures would probably require subsidies or larger cost-sharing than provided under Agriculture Conservation Program. Selective control of land along streams to create a "buffer zone" would probably require acquisition by the purchase of land use rights at some level of government.

Landowners of 25 acres or more and concentrated feed lots of less acreage are requested to have a plan prepared by their county conservation district. At this point, there is no penalty for non-compliance. Legislation must be passed for compliance to the planning law and mandates for implementation of the plan. Much will be done voluntarily by the agriculture community, but some conservation measures must be mandatory to achieve the 208 water quality goal which in turn certainly will contribute to better quality water in our Great Lakes. Farmers should also be reminded that by controlling erosion they are also increasing the value of their land and its production potential.

CONSTRUCTION

The panel identified construction as sixth in its priority listing. Although mentioned within a number of other priority items, it was felt that construction, whether in an urban or rural setting, whether for erosion protection or highway development, was a potential source of pollution within the basin.

It was felt that remedial measures should be administered equally throughout the basin. Pollution from most forms of construction are preventable or can be minimized by correct procedures. If they do occur, cost of any remedial measures should be paid by the pollutor.

Implementation of control and remedial measures should be at the local level with oversight by higher levels of government. Enforcement is necessary to insure compliance and control.

The recommendations to control pollution caused by construction are:

1. Filing and review of environmental impact statements for all construction projects of any significance (probably use a minimum total project cost as the point above which statements must be filed).

2. If item 1 above is satisfactory, issue a permit.

3. Inspect during construction with power to halt construction if proper safeguards are not being employed.

4. Followup inspection after project completion to determine that impact statement was correct.

EROSION/SEDIMENTATION

Erosion/sedimentation was considered the lowest of the seven pollution priority areas in the Great Lakes Basin that the panel identified as non-point source.

These are considered a problem because they not only remove valuable topsoil, depositing it in streams, rivers and lakes necessitating dredging, but also result in turbidity, and depending on particle size, absorb and carry a wide variety of pollutants including nutrients, pesticides and toxic substances. These materials then become available to the receiving water system.

The panel believes that equal *OBJECTIVES* should be administered throughout the basin based on local conditions, that federal and state levels should pay the cost of remedial programs, that implementation should be at the federal and state level and that enforcement is necessary with a strong emphasis on education.

The recommendations for controlling pollution caused by erosion and sedimentation involve ways of preventing the erosion via structures and collection and treatment of any resulting major quantities. A strong education program is needed in this area.

OTHER PRIORITY AREAS

DEEP WELL DISPOSAL

Deep well disposal of pollution potential materials does not appear to be a problem at this time. High cost plus the requirement of compatible rock formations precludes extensive use today. With increased restrictions on other forms of disposal, however, use of deep wells may become a viable substitute in the future.

We urge the continuance and expansion of federal programs of research investigating movement of pollutants in subsurface formations and methods that can be used to restore polluted groundwater. The states and industries interested in deep well disposal should be encouraged to cooperate fully in these research programs.

Administration of control measures should be carried out at the federal level with cooperation by the states. Because the safety of deep well disposal depends on a thorough knowledge of the compatibility of the disposed material and the rock formations involved, each site will have to be considered as a separate request. Remedial programs, when necessary, should be at the cost of the owner (industry or municipality) involved. Remedial measures could be carried out voluntarily with enforcement backup when required.

Disposal of material is often a waste of resources. More economical use of industrial byproducts is essential if we are to save energy and materials and, at the same time, preserve the quality of our environment. Alternate uses of byproducts should be developed by industry. The deep well method of disposal should not be encouraged, but used only as a last resort.

EXTRACTIVE AREAS (MINING)

Land requirements for mining are predicted to increase by 500% over the next 50 years. Although impacts are generally restricted to local drainage areas, in the past they have been shown to be severe. In addition, some of the discharges involve radioactive materials. Strict controls should be maintained and, where necessary, increased to insure that mining does not become a future problem within the Great Lakes Basin.

Distance from the lake, soil type, etc. can be a start in attempting to implement remedial measures. It is felt that there is no easy means by which measures can be equally administered throughout the basin. Implementaton could take place, however, within broad guidelines put forth by the two federal governments.

The burden of remedial measures should be borne by the corporations involved as long as financial resources are available. State and provincial governments should be responsible for implementing remedial programs. Ultimately, the federal governments must have final responsibility to insure equitable control across boundaries. There is no question that enforcement is necessary.

FORESTRY

Pollution from forestry operations appears to be extremely minor and should be given a low priority. Remedial measures cannot be equally administered throughout the basin. Such considerations as distance from lakes, soil type and amount of rainfall, etc., must affect implementation. There is no sense in implementing solutions to a problem in areas where the problem does not exist.

Cost of remedial measures, when required, should be borne by the industries or municipalities directly involved. When measures are required over a broader area where a specific "user" is not involved, remedial programs should be financed at the highest level possible. Implementation of remedial programs should be the responsibility of all levels of government. This is necessitated by the fact that there will be high cost areas into which funds must be diverted by the federal government.

The only way corrective measures will be accomplished is through an enforcement policy. In this day and age where the bottom line is so important, there would be few businesses which would voluntarily spend money to solve pollution problems.

RECREATION

All aspects of recreation combined appear to have only a negligible effect on the overall water quality of the Great Lakes. Several concerns were raised, however, over specific pollution problems that now exist and possible problems in the future.

A great portion of the lakes are being used for recreational purposes by millions of people visiting or living in seasonal homes. Recent surveys indicate that many of these visitors are boaters and fishermen who are in part responsible for degradation of water quality and other problems. Since a majority of seasonal homes border on water, many of them on sites which have severe limitations as to development, they produce problems regarding water quality and concern from faulty septic tank systems.

Just from observation, one can see the shorelines getting dirtier as the summer season progresses. Surface oil is noticeable from boating. These are small local problems, but they must be dealt with to insure good recreational opportunities for all.

Shoreline areas must be protected by the private owner and various parks and recreational areas will have to be expanded to take care of the increase in use during the next 20 years. It has been suggested by one panel member that we begin now to insure use of the shoreline in the future by requiring that all private dwellings be set back from the water's edge. Moving back of all dwellings would not deprive ownership, but rather enhance it. Most of the beauty of the shore is destroyed by each unit being constructed without due concern for the presence of others. The beaches, shores, views, etc., would revert to all of the people to be enjoyed in their own way whether via roads trails, or just footpaths.

Another concern expressed is the quality of outdoor recreation available now and in the future. The question of providing for the specific outcomes of quality of recreation must be addressed. Namely, that of the aesthetic experience which may serve to lift the human spirit and, that proportion of the Great Lakes Basin land mass that may or should be set aside to provide for an outdoor experience that is not visually polluted by industrial and residential sites and a concentration of people -- which most people seeking outdoor recreational outlets are attempting to avoid.

The administration of remedial measures should be equal regardless of distance from the lake, unless the pollution source gets specific benefits from its proximity to the lake. If a specific monetary benefit results from a pollution source being near the lake, it should pay a compensatory penalty if it is a proportionally greater polluter.

Because of the dispersion of recreational users, costs of remedial programs should be borne by the federal or, at most, state and provincial governments. Where private industry or communities are specifically involved, they should also share in the cost.

The federal government should be responsible for implementing remedial programs to insure uniformity among the geographically dispersed potential pollution sources. Actual implementation could be carried out at the state and provincial level or in some cases, at the local level. Enforcement is necessary to insure that uniform standards are met.

TRANSPORTATION

Transportation has three effects upon water quality within the basin. First, erosion and sedimentation during construction; second, increased runoff; and third, pollution from road salting and from vehicles. During construction, the last work to be done is usually to reseed and plant the shoulders and right-of-way on the sides of highways and roads. It would save money if there were restrictions placed on how much cleared area there could be. This would reduce the amount of land susceptible to erosion. Furthermore, it would cost little, if any, extra to place a time requirement on how soon the exposed land must be replanted.

Stricter controls should be placed on the conditions under which streets and highways are salted and on the amount of salt used. In addition, plowing and sanding should be considered as a viable alternative to salting instead of a secondary method of snow removal as it is in some areas.

Equal basic measures should be enforced across the entire basin. Stricter measures should be administered in critical areas where impacts would be greater. Costs of remedial measures in most instances would be quite low and could be borne by the local or regional municipalities. Generally, it is an education program that is required to provide information on where construction should occur, when and how to best control erosion during construction, and how to juducially use salt in de-icing.

Initiation of an educational program should be at the federal level with implementation at the state or provincial level. Implementation of remedial measures programs should rest with the states and provinces with "pass down" to the local level where practical. Controls should be in the form of enforceable laws.

UNITED STATES PUBLIC PARTICIPATION PANEL MEMBERS AND AFFILIATIONS

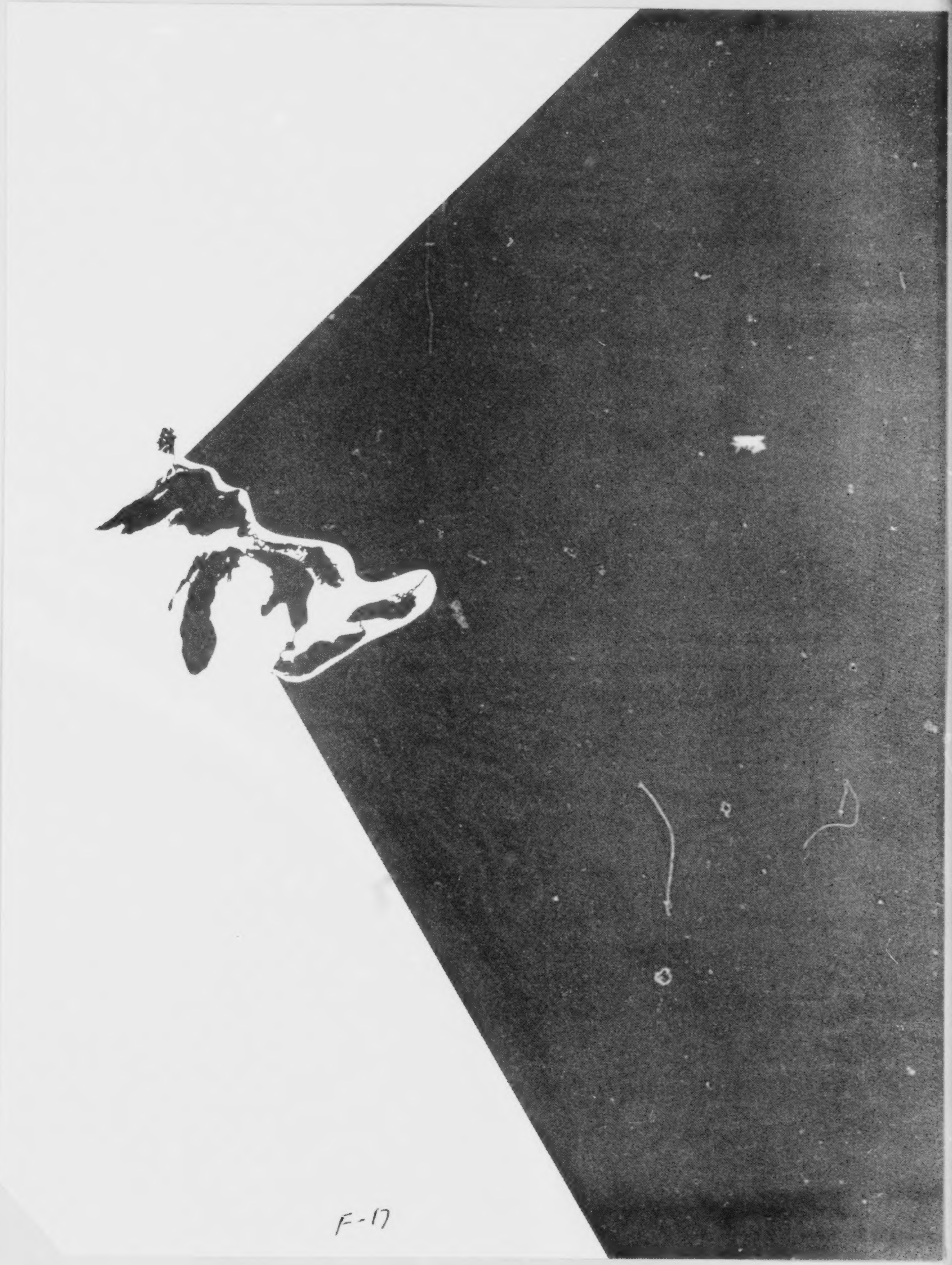
NEW YORK

NAME	AFFILIATION
Alan Taddiken	Research Analyst, Center for Governmental Research, Inc.
Tom Frey	State Assemblyman
Arthur Steneri	Consulting Engineer (involved with St. Lawrence Eastern Ontario Commission)
John Judd	Panel Chairman, Executive Officer, N.Y. State Sea Grant
Joseph Salvo	N.Y. Public Interest Research Group
Gary Proud	State Assemblyman
Robert Rock	Dean of Students, State University of N.Y.
Richard Preibisch (alternate for Stan Friedman)	Spaulding Fibre Company
Edward Beane	Business Manager, Thousand Island Citizen Advisory Committee
Lucien Morin	County Manager, Monroe County
Dr. Cornelius Murphy	Environmental Consultant
Elizabeth Schwarz	League of Women Voters (Rochester)
Floyd G. Nolan	Pulaski Chamber of Commerce
Bruce Wager	Citizen Participant, Erie-Niagara Regional Planning Commission
Hans Paller	Engineer, Outdoor Writers Assoc. of America
W.J. Marcellus	President, High Speed Hammer Corporation
William Chamberlain	Dairy Farmer
James Czapla	Hooker Chemical Company
Richard Leonard	Environmental Consultant, Calspan Corporation

LIST OF APPENDICES

The following list of appendices includes comments on the PLUARG background papers and individual comments submitted by the panel members.

1. Recreation and Tourism
2. Agriculture
3. Septic Tanks
4. Deep Well Disposal
5. Shoreline and Riverbank Erosion
6. Shoreline Landfilling
7. Solid Waste and Sewage Sludge Disposal
8. Transportation
9. Extractive Areas - Mining
10. Forestry
11. Urban
12. Landfills/Waste Disposal
13. Atmospheric Loadings to the Great Lakes
14. Environmental Health Issues
15. Toxic Substances
16. Remedial Measures Philosophy
17. League of Women Voters Positions
18. General Comments



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REPORT OF THE
OHIO
PANEL

January, 1978

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INTRODUCTION

Enclosed is the report of the Ohio Public Consultation Panel which I have prepared and am submitting at the panel's request. Individual comments are to be found in the appendices. Panelists wished to emphasize to PLUARG their concern regarding the increasing evidence of toxic pollutants in the Great Lakes from all sources: atmospheric inputs, landfills, run-off, industrial stockpile leaching and point sources. It is essential that additional research and immediate regulation of known toxics be instituted.

The panel also recommends that PLUARG and the International Joint Commission continue to use the panel as a resource during further stages of its work. Panelists felt that time and effort spent to date could be effectively tapped and built upon in the future.

Ohio panelists included persons representing a wide range of viewpoints and varying expertise. Those who attended meetings and participated in panel deliberations are listed at the end of this report.

The Chair respectfully requests that future appointing bodies obtain commitment to participate or vacate from those persons who are appointed. We were poorer for the total lack of participation of four appointed panelists who did not attend, send alternates, resign or other wise indicate they were among the living.

We wish to thank PLUARG members who assisted us, and are particularly grateful to Floyd Heft for his assistance to the panel.

It was heartening and refreshing to participate in a public participation process where neither staff nor agency has attempted to dominate or control the proceedings or recommendations of the public group but,instead provided information and staff support. Keep up the good work! One of our panelists, an elected official, who is somewhat cynical regarding the attention paid by agencies to public input asked if you would really pay any attention to the recommendations of the panels. He was assured that you would. We hope that you will report back to the panels as to the disposition of their recommendations in your final report to the International Joint Commission.

The Chair wishes to thank members of the "writing committee" who gave their professional time to assist in the preparation of the draft report which was considered at the final meeting of the panel. They were: Ray Robinson, Don Urban and James Cowden.

Mimi Becker /s/
Ohio Panel Chairman

PANEL TASKS

Panelists met four times: October 11, November 15 and December 13, 1977 and January 19, 1978 and performed the following tasks:

1. Considered the PLUARG Reference, major associated issues, the remedial philosophy and possible remedial measures.

2. Identified and evaluated specific land use related water pollution problems occurring in the Lake Erie Basin.

3. Identified some desirable results they would like to see achieved for the Great Lakes Basin.

4. Agreed on priorities for solving non-point water quality problems in the Lake Erie Basin.

5. To determine how PLUARG concerns and resulting recommendations could be acted upon, and to inform themselves of the status of related programs the panel was briefed by:

    a. Richard Bartz of the Ohio Department of Natural Resources relative to the goals and status of the Ohio Coastal Zone Management Program.

    b. Angelo Coniglio, Buffalo District COE who summarized the purpose and status of the Lake Erie Wastewater Management study which the COE is conducting under authorization of PL 92-500.

    c. Panelist Ray Robinson, a consultant to the Ohio Land Use Review Committee of the General Assembly, briefly summarized the committee's work and the forthcoming legislative package as a potential tool for assisting with remedial actions.

    d. The status and potential of the 208 Wastewater Management program in Ohio was also discussed by the panelists, many of whom have had personal/professional involvement with the program.

    e. An evaluation of the existing legal and institutional capacity of state law to provide or assist with remedial solutions was provided by PLUARG member, Floyd Heft of ODNR.

ORGANIZATION

In organizing itself for the tasks to be accomplished, the Ohio panel identified seven basic categories as sources of major pollutants to the Lake Erie Basin in Ohio. Each category of sources was to be examined by a panel task force and was to include examination of the pollutant sources which were identified by the panel at its first meeting. It should be noted that certain pollutant inputs affect many sources and were considered by a number of task forces. These included atmospheric inputs, toxics, and waste disposal. The panel also voted to include interested observers as full working members of the task forces, and accorded observers the privilege of participating in panel discussions.*

1. Sedimentation --to include poor agricultural and forestry practices.
   Dale Stacey, Calvin Kiracofe (In this report sedimentation is discussed in sections on urban and agricultural non-point pollution.)

2. Urban Runoff --to include ineffective storm water management, construction runoff, waste disposal, atmospheric inputs, toxics, chemicals such as fertilizers, pesticides, etc.
   Rich Novak, William Jackson

3. Chemicals (Agricultural) --phosphorous, nitrogen, pesticides, herbicides, fertilizers.
   Frank Goodell, Floyd Heft, James Cowden

4. Industrial Sources --stockpiles, toxics, atmospheric, waste disposal.
   Michael Arcaro, Mimi Becker, Allen Muhic, Barbara Wiese

5. Shoreline and Streambank Erosion --Steve Nacht, George Kunkle, Tom Gilles

6. Unsewered Waste Disposal --septic systems and on-site disposal.
   Don Urban, Robert Roush

7. Incompatible Land Use Activities --planning, land capability vs. land use.
   David Cashell, Margaret Cummings, Ray Robinson

It should be noted that all of the above categories and the remedial solutions considered included major discussion of the institutional issues involved and that many panel suggestions for remedial measures consist of solutions that depend in whole or in part on institutional or non-structural measures.

Task force reports regarding their findings and recommendations were discussed at the December 13 meeting of the panel. All written materials generated as a result of task force works are to be found in the appendix. This report includes reports of their recommendations or conclusions in the sections so labelled.

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* Task force members met over lunch to map out their approach to their problem area. Many wrote position or background papers and met separately to accomplish their assignments. Some groups were not able to complete their tasks.

GOALS

Aspirations of panelists for the future of the Great Lakes Basin and which were noted to be desirable outcomes of remedial or prevention programs were identified by panelists as follows: (order is not indicative of priority nor necessarily of panel consensus)

-- aesthetically pleasing water quality
-- ban further degradation of the lakes
-- clean water species of fish
-- return of commercial fishing
-- increased commercial transportation (shipping)
-- controlled lake levels to reduce erosion
-- economic conversion of lake water to drinking water
-- environmentally sound resource development
-- fishable (edible) and swimmable water
-- high quality drinking water
-- preservation of wetlands and environmentally critical areas
-- public access to the lakes
-- preservation of aquatic plant and animal communities
-- recreational development
-- rehabilitation of lakes to at least the mesotrophic state
-- restoration of lakes to background conditions
-- retardation of loss of land through shoreline erosion

It should be noted that only *ONE* goal (transportation) does *NOT DEPEND* upon improvement of the water quality of the Great Lakes. None of the panel felt that the present water quality of Lake Erie was acceptable and none argued that major remedial actions were not necessary. The panel agreed to keep these aspirations in mind when considering which remedial actions it would recommend.

REMEDIAL PHILOSOPHY QUESTIONS

The Ohio PLUARG panel finds that the waters of Lake Erie are continuing to be polluted by our land use activities, and that remedial measures must be implemented to reduce sources of water pollution to the lake and to prevent future pollution of the Great Lakes.

The panel finds that it disagrees on two major points with PLUARG's Remedial Measures Philosophy. After discussing sources of pollution from land use activities, we wish to submit our recommendation that remedial solutions must be applied to the *ENTIRE* Lake Erie Watershed, not just to downstream portions of the Lake Erie tributaries. The cumulative impacts of upland pollution in heavily populated portions of the basin make this an essential part of the remedial solution for the basin. Secondly, we believe that remedial measures should be equitably enforced throughout the entire Great Lakes Basin. Water quality standards and criteria should be uniform throughout the basin. However, we also recommend that areas of the Great Lakes which are less polluted than others *NOT* be allowed to become further degraded and that preventative measures be taken throughout the Great Lakes Basin to prevent further pollution of the lakes from occurring. The issue of equitable enforcement of remedial measures and water quality standards is a serious one. Questions of both constitutional and practical equity led the panel to believe that remedial actions would be unsuccessful and possibly politically unacceptable unless the same results were required of all those engaging in activities causing pollution: Those who are presently polluting should stop. Those who might pollute in the future should be prevented from doing so. Generally speaking, those who pollute should bear the cost of clean-up and prevention. Public cost sharing should be written into remedial solutions which involve the implementation of public policy.

Appropriate levels of government to implement remedial solutions and the panel's general feeling about cost allocation will be discussed as they relate to the specific problem areas identified.

The panel also considered a number of non-structural solutions to assist in the abatement of non-point sources of pollution and felt that many of these were very promising. They hope that PLUARG will not be limited by structural solutions, many of which may be very much more expensive than some of the non-structural solutions. If adequate public education is provided so that the public understands the why and the how of a public policy, non-structural solutions to water pollution problems can be less costly than structural solutions. It may be easier to obtain voluntary compliance with such measures and many are more politically feasible as a result.

With respect to the panel recommendation to impose remedial measures on the entire watershed, some examples to clarify the panel's reasoning might be considered. Reduction of pollution is accomplished incrementally. It should be the responsibility of all entities in a given watershed to reduce inputs of pollutants to the watershed. Unless all possible inputs to the river are reduced, and reduced as far upstream as the river goes, it will be impossible to even monitor for future purposes when a new measure is needed to prevent new source pollution or when an existing remedial measure being applied by the City of Cleveland, for instance, is successful. The same might be said for the City of Toledo and Maumee Bay. The sediment load carried from the upper reaches of the Maumee River is very large and contributes significantly to the pollution of Maumee Bay. Only if it is possible to develop and adopt more effective sediment control measures will the loadings to Maumee Bay be significantly diminished.

With respect to our opposition to anything that would be considered a "double standard" relative to water quality or to the enforcement of remedial measures, we would ask PLUARG to consider the following: We have, at least in the United States, water quality standards. They may not be perfect, or cover all the parameters necessary. We may eventually need to add additional parameters to cover materials not now included. A standard should be considered as a goal to be met -- by everyone and the requirements should be the same in terms of the goal. Our philosophy should not be predicated on the fact that we have not yet attained the results called for in our standards. All should be required to meet the standard. This may require more effort for some than for others and it may be that cost sharing policies should take this into account. Certain kinds of land use activities imposed upon certain types of land cause more serious amounts or types of water pollution than others. These activities may have to be more stringently regulated than others, but the *GOAL* with respect to water quality should be the same. For example: the remedial measures to prevent the infiltration of toxic substances into basin water supplies from landfills, deep-well disposal sites and atmospheric inputs may require extremely stringent mandatory,regulatory and enforcement measures.

Panelists generally agreed that we have a number of basic policy tools on the United States side of the Lake Erie Basin which would assist us in the development and implementation of remedial measures to reduce non-point pollution to the basin. Included in these, but yet to be implemented are the Safe Drinking Water Act, the Toxic Substances Act, the Hazardous Waste Management Act, the Coastal Zone Management Act, and the management plan to be developed by the 208 Wastewaster Management Program for Ohio.

The panel endorsed the following recommendations which it believes will help to provide a policy and institutional framework for remedying Ohio's contribution of the non-point pollutants to Lake Erie.

1. Support of the basin concepts (including enforcement) developed in the original report and version of H.B. 513: The Agricultural Pollution and Urban Sediment Abatement Bill (see List of Appendices).
2. Support of the goals embodied in the GUIDE For Land Use Legislation reported by the General Assembly Land Use Review Committee.
3. Support the concepts embodied in Section 208 of PL 92-500.
4. Support of major efforts to educate the public regarding the causes of non-point pollution and alternatives for remedial action.
5. *Uniform Enforcement* of environmental laws and regulations already on the books such as: 92-500, Safe Drinking Water Act, Hazardous Substances Act, Toxic Substances Act, etc. (not to be considered an inclusive list).
6. Develop policies that will encourage the preservation of farmland and encourage use of that farmland within its capability.
7. Make public education regarding sources of water pollution and alternatives for preventing further pollution and remedial actions a top priority basin-wide.
8. Continue to use the public panels as a basic resource.
9. Give high priority to research, evaluation of findings and development of alternatives to prevent further contamination of the Great Lakes from atmospheric inputs...particularly toxics.

LAND USES INCOMPATIBLE WITH LAND RESOURCES

FINDINGS

This topic was defined as involving two major issue areas relative to non-point source pollution: 1) The conservation of natural resources and the preservation of environmentally sensitive areas; 2) the better management and more effective and efficient servicing of urbanizing areas. Problems in both issue areas derived from the basic fact that past and current land use decisions of all types are individually made, seldom involve more than a consideration of immediate economic factors for the property owner or use, and rarely relate to official local, county or regional plans and planning functions. Most land use planning and management efforts today are of a reactive nature, responding to proposals and decisions made by individuals and agencies without benefit of the studies and considerations normally inherent in sound planning and management programs. Many of the major water and sewer systems being proposed and committed today are in response to urban developments already in place or proposed. Urban growth areas and the resulting requirements for service systems are primarily determined by land speculation, promotion and scattered development rather than on the basis of an evaluation of areawide needs, land suitability for particular uses and the efficient provision of urban services.

Zoning which continues to be the primary land use management tool for most communities, has been generally ineffective in achieving goals normally identified with the two areas of issues identified above. Zoning regulations have been written to achieve objectives such as the preservation of the "status quo", the separation of land uses having perceived or assumed incompatibilities, or the promotion of fiscal or tax base advantabes or growth. In few cases has the preparation of zoning codes and maps been based on the analysis of land capabilities and suitabilities for various types of uses, on the long range service capabilities and needs of the community or region, or on the objectives and priorities of on-going local and regional planning processes. Further, existing zoning regulations frequently have proven to be an ineffective long range land use management tool because of local administrative practices which have included the granting of variances and zoning changes in response to pressures and promises of community or individual economic benefit or hardship. Zoning codes are often the product of only a local layman's input which may not include sufficient expertise to address and analyze long-term impacts or implications.

In many parts of Northern Ohio today, suburban and rural development patterns are being determined primarily on the basis of whether the county health departments will issue septic tank permits for homesites of various physical characteristics. Consideration of potential health problems has become the only determinant in establishing urbanization patterns of areas surrounding most cities and urban counties. "Septic tank" subdivisions scattered throughout the metropolitan areas and their surrounding rural regions are determining future urban service areas and are forcing committment of major capital resources from urban centers with declining tax bases to provide major service systems for them. They are also causing increased water pollution.

Although there are many major problems associated with the development of major water and sewer systems, they are not in themselves usually considered major non-point sources of pollution. However, the development described which results in the urbanization of present rural areas is seen as a catalyst for the activities which are major causes of urban non-point pollution: paved surfaces, storm water management problems, destruction and modification of natural drainage patterns and natural vegetation, erosion and sedimentation, inadequate disposal of liquid and solid wastes, increased reliance on private automobiles and others. The great impact of urban runoff on water quality, in spite of the relatively small percentage of the total lake basin land area involved, suggests the importance of developing better ways of determining urban development areas and providing for future areas for urbanization.

RECOMMENDATIONS

The panel recommends that better means for making land use decisions regarding urban development be developed and believes that such a program would provide for substantial reduction of potential new sources of water pollution in the Lake Erie Basin. Areas for urbanization should be specifically identified and committed on the basis of coordinated local, county and regional planning processes which include a thorough evaluation of land capabilities, suitability of development, future land use needs, efficiency of service systems, the preservation of significant natural features and the conservation of natural resources. Urbanization must be limited to those areas so determined and for which urban services already exist or have been committed through adopted capital improvements programs. Within these urbanization areas, as well as in existing urban areas, steps should be taken to identify and preserve natural drainage courses, wetlands and other undeveloped areas which could be utilized for natural or man-made restorative, settling and retention areas. In both urban and rural areas, basic changes in storm water management philosophies are needed. Rather than continuing to develop storm water management strategies based on expediting the removal of storm water out of the area, new storm water management strategies should be developed to detain and retain runoff in the tributary basins themselves.

Such solutions to the water pollution resulting from urban sources will require remedial action at all three levels of government, including basic policy changes within the Environmental Protection Agency. Costs will be shared by all levels of government and by private developers.

The panel supports, in general, the concerns expressed in the recommendations of the Ohio Land Use Review Committee of the General Assembly.

These recommendations are provided in the appendix in the publication entitled: GUIDE: a Guide For Land Use Legislation. The Ohio Land Use Review Committee, published in June of 1977. Below, from that document, is a summary of recommendations of the Ohio Land Use Review Committee which relate to the development of land use policies which would have impact on water quality in the Ohio Lake Erie Basin. These recommendations would provide an improved framework for land use decisions through implementing overall and special land use goals described by the following:

Strengthening The Role Of Municipalities

a. Planning commissions in each municipality should prepare a comprehensive municipal development plan for adoption by the legislative body.

b. Municipal development regulations and their administration should conform to the adopted municipal development plan.

c. Municipalities should be enabled to combine regulatory measures in a single development code.

d. Each municipality should prepare and adopt a capital improvements program which conforms to the adopted municipal development plan.

e. Townships should be enabled to create a township planning commission and adopt a comprehensive township development plan.

f. A township development plan should be consistent with the provisions of an adopted countywide general plan.

g. The board of township trustees should be enabled to adopt a township zoning code which conforms to an adopted township development plan.

Providing For A More Coordinated Approach To Land Use Decision Making

a. In each county there should be a countywide planning commission whose membership represents local governments and reflects the population distribution in the county.

b. A countywide general plan should be prepared, adopted and periodically updated by the countywide planning commission.

i) The plan would address the following:
- land use element showing future development patterns
- urban service areas where water and sewer services will be made available
- location of major transportation facilities
- critical resource areas, including significant natural areas, prime agricultural land and scenic river corridors
- open space and recreation areas
- estimate of current and prospective housing needs within the county

c. Area wide planning and coordinating agencies should assist in the preparation of countywide general plans.

d. An adopted capital improvements program should conform to the countywide general plan.

e. A county development code should be adopted to conform to the countywide general plan.

Improving The Adequacy Of Land Use Regulation

a. Enabling legislation for zoning and subdivision regulation should be revised to improve their adequacy.

Coordinating State Agencies

a. The General Assembly should provide explicit statutory authority and responsibility to the governor for coordinating state agencies.

b. An explicit statutory direction should be provided for the coordination of federal grant applications made by state agencies.

c. The General Assembly should revise specific statutory and program responsibility to clarify departmental roles in land use coordination.

d. The General Assembly should establish a state-local government commission to oversee state recognition of countywide general plans.

Reducing Fiscal Disparities

a. The General Assembly should undertake at an early date an appropriate effort to design and implement an effective and practical approach to reducing fiscal disparities among local taxing districts.

Preserving Prime Agricultural Land

a. Individual landowners should be authorized to create agricultural districts voluntarily.

b. Government actions should respect the long term commitments by landowners forming agricultural districts.

c. The state should adopt a policy which encourages agricultural land use.

d. The primary application of agricultural use value assessments should be in agricultural districts.

e. Zoning enabling statutes should authorize the recognition of agriculture as a principle use.

Regulating Large Scale Developments

a. A single uniform regulatory process for large scale development should be established by the General Assembly.

b. The review and approval of large scale developments should be subject to administrative appeal.

Protecting Critical Resource Areas

a. Protection of critical resource areas should begin with nominations by the countywide planning commission.

b. The Ohio Department of Natural Resources should evaluate areas nominated by a countywide planning commission.

c. The countywide planning commission should have the authority to designate critical areas for special protection.

d. The countywide planning commission should recommend measures for the protection of designated critical areas.

URBAN RUNOFF

The panel considered the issue after evaluating the PLUARG position papers on urban runoff. The panel members appeared to be in general agreement with the findings. Dr. William Jackson prepared additional background and comments for the group's consideration. However, members wished to comment specifically on the following concerns:

1. Urban non-point pollutants come from many sources and include many pollutants. Remedial solutions must concentrate not only on treatment, but on limiting the sources. Where possible, the panel recommends the same basic remedial philosophy for urban non-point as for rural: Pollutants should not be allowed "off-site".

   Additionally, the parameters generally used for determining water quality in urban areas are inadequate. Additional parameters for determining the types and amounts of toxic materials present are essential if an adequate remedial program is to be implemented.

2. Urban run-off added to sewage treatment systems which occurs after storms, adds substantially to the pollutant loadings to Lake Erie from Ohio urban areas.

   We observe that generally, proposal and construction of separate storm sewers for large urban areas are economically and politically unrealistic and believe that retention and/or detention of storm water runoff is a more economic and attainable reality. Alternative remedial measures should include at least the following:

   a. Construction and use of temporary holding basins or provision of or capacity for in-pipe storage which would provide for gradual release of storm water runoff into the sewage-treatment plants.

   b. Reduction of types and quantity of pollutants released during periods of storm water runoff by regular street cleaning and careful maintenance of catch basins and sewers.

c. Development and implementation of better urban land management practices to reduce runoff from fertilizers, pesticides and herbicides used on lawns, tree lawns, parks, golf courses and other "green" urban areas. Education programs are essential to provide urban land managers the basic information which is necessary to implement proper management practices.

d. Additional solutions for reducing urban non-point pollution should include the use of permeable surfaces for parking lots, and other urban asphalt areas; reduction of the amount of lead used in gasoline, and improvement and maintenance of urban freeway drainage systems.

e. Atmospheric pollutants to urban areas must be reduced. It is senseless to grant exemptions to sources polluting the air because of the eventual impact on the quality of the water. Panelists expressed concern that research regarding sources and impacts of atmospheric inputs to the Great Lakes continue.

f. Additional recommendations found in the chart prepared by Dr. William Jackson were accepted by the panel.

Measure	Local or Basin-wide	Payment of costs**	Levels of Gov't involved	Voluntary or enforced	Priority
*Prevent soil loss at bldg construction sites	B	Pvt-L	L & S	E	1/2
*Prevent soil loss in road construction	B	Pub-LSN	LSN	E	1/2
*Slow & treat runoff from bldg., etc.	B(Urban)	Pub&Pvt-L	L	E	2
*Retard storm drainage natural surfaces	B	Pub&Pvt-L	LS	E c/s	1/2
Proper solid waste disposal (landfill)	B(urban)	Pub&Pvt-L	LS	E	1
Proper sludge disposal	B	Pub-L	LS	E	2
Develop public education	B	Pub-LS	LS	V	1***
Activate Emergency Procedures	B	Pub&Pvt-LSN	LSN	VE	1/2

Priority 1. Short term

2. Long term

* Stated components

** Payment of Costs Public local

State

Private National

*** Highest priority

C/S = cost share

UNSEWERED WASTE DISPOSAL

The concerns upon which the remedial measures are based are detailed in the committee report which is attached. There is general agreement that the present institutional arrangements separate the control of on-site disposal and water quality. There exists a multitude of jurisdictions, each establishing its own standards and regulations concerning on-site sewage disposal. The general public, on the whole, is not aware of the costs, maintenance requirements or principles of on-site sewage disposal, or of other effects of indiscriminate placement of septic tanks and leach fields across the landscape on such things as water quality, sewer service costs, land use, prime agricultural lands, schools and other service needs.

The following remedial actions are given in the context and as a result of these kinds of concerns.

Remedial Actions

The remedial actions proposed by the Ohio panel were in four general areas. It is suggested that all of the remedial actions proposed be applied equally throughout the Lake Erie and Great Lakes basins. We cannot conceive that it is realistic to assume that we can develop either the mechanisms or the legal tools to provide for an effective "double standard" or to deal with the issue of equity. The minimum standards for water quality have already been set (for the United States portion of the basin) by federal legislation. The actions proposed by the panel are directed toward state implementation of programs which will meet or exceed these standards. Primary costs would be borne by the state General Fund (that is those costs which are not underwritten by federal funds) since the actions will benefit all citizens. Four action categories are proposed.

1. Institutional Arrangements: a single agency needs to be responsible for on-site sewage disposal and water pollution control activities.

2. Performance Standards and Criteria: minimum state standards and criteria must be established. Local standards can be set and must meet or exceed state minimums.

3. Education: uniform enforcement and implementation action means improving the competence of state and local agency personnel and the development of a program to insure full citizen awareness of the limitations, alternatives and impacts of on-site sewage disposal.

4. Overall Planning: on-site sewage disposal must be incorporated into the overall sewage disposal planning now being done by 201 and 208 wastewater management planning agencies and with area-wide land use planning activities.

More specific actions are recommended for Ohio. To address the four issues stated above we submit the following recommendations.

Institutional Arrangements

1. Legislative action is required to incorporate the OEPA mandates in the area of water quality and the State Department of Health mandates regarding septic systems and public health into one agency at the state level.

2. Legislation that mandates areawide (county) management systems that includes both public and private sewage disposal under one jurisdictional responsibility is needed.

Performance Standards And Criteria

1. Legislation to require the establishment and enforcement of minimum state standards for the selection, installation and management of on-site sewage disposal systems. This legislation should provide for:

   a. licensing of all septic tank leach field systems to meet performance standards of no discharge off property

   b. licensing of all aerator systems

   c. licensing of alternative systems to meet "no discharge" performance standards

   d. mandatory education and certification of all persons responsible for approval, inspection and certification of on-site sewage disposal systems (including "package plants").

Education

1. The State of Ohio should develop and implement a public awareness program on the proper installation and maintenance of on-site sewage disposal systems. No legislation is presently required, although money from the General Fund would have to be allocated during the budget setting process to fund the program.

2. Training programs for employees of local implementing agencies (presently the boards of health) on various methods and techniques of developing and maintaining on-site sewage disposal systems should be mandated by the state. (This could be done by executive order or by agency regulation.) This could become the basis for meeting certification requirements cited above. Costs met by the state.

Overall Planning

1. Present EPA and OEPA directions to 208 agencies treat sewage disposal systems and on-site sewage disposal as separate elements. The handling of human waste must be done on not less than a county-wide basis and

the management of both private and public on and off site disposal or waste treatment systems must be under the jurisdiction of one agency. Existing legislation permits this and EPA direction to 208 agencies can foster this.*

2. Coordination of activities of land use planning agencies and activities of local governments and wastewater-human waste disposal planning/management agencies must be accomplished. Legislation would be required to mandate this coordination. However, the development of agency criteria (EPA, HUD, OMB, etc.) which would require proof of coordinated planning and management for local governments to receive either federal funding or to meet certification requirements for pollution control or management systems would be possible and could act as both incentive and as "stick".

General

1. The fragmented decision process at the local and state levels of government causes "built-in" conflicts for improving water quality. The true social and economic costs of this conflict, when weighed against the costs of providing sewer service at public expense versus the installation of on-site sewage disposal on a scattered basis, is not being fully evaluated. Water quality improvement is only one other reason for better coordination of the development of sewer systems, on-site disposal systems and land use decisions.
2. Water supply and wastewater management are responsibilities which should be carried out in the public interests by public agencies. Private systems must be under the ongoing supervision of a water quality management agency and must be required to conform to established goals and plans for a region.
3. It is the panel's general conclusion that requirements for maintenance of on-site disposal systems,including package,plants at performance levels which would prohibit any off-site pollution would assist in solving some present water quality problems. It might prevent many future ones.
4. Encouragement of water conservation practices would result in less wastewater to dispose of and would result in the reduction of pollutant volumes from on-site systems.

Please refer to specific information presented in the appendix.

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* The panel recommends withdrawal of authority for permitting water supply and wastewater management facilities from the Public Utilities Commission of Ohio. They do not have expertise or authority to monitor and therefore cause direct conflicts with local and regional water management goals.

AGRICULTURAL PRACTICES: (CHEMICALS, FERTILIZERS, PESTICIDES, TOXIC MATERIALS)

Institutional Factors*

The identification of concerns and the establishment of findings with reference to chemical pollution from land use activities is intimately tied to other considerations of the panel. The problems of phosphorus, other components of fertilizers, pesticides and various toxic materials, cannot be separated from the overall problems of non-urban runoff, erosion and sedimentation and the evident incapacity of government to deal with it. Remedial measures cannot be identified without aknowledging the institutional problems that severly constrain solutions. (* Appendix on Institutional Constraints)

Current institutional arrangements in the Lake Erie Basin illustrate the inadequacy of water resources management. They are highly fragmented by jurisdiction and function, lacking a common purpose or even a uniform viewpoint of the resources for which they compete. There is no coordinating mechanism to focus attention on the whole lake and its problems. There is a division between state and local concerns, with states concentrating generally on regulatory and planning activities and local agencies dominating construction, operation and land use controls. Remedial measures under local agencies are hampered by geographic, jurisdictional and fiscal limitations, and narrow functional viewpoints unguided by any basin-wide or lake oriented goals. While correction of these problems was assigned to area-wide planning agencies under Section 208, P.L. 92-500, it does not appear that these objectives will be attained in the basin. To remedy these problems, the panel recommends:

1. That PLUARG inventory the agencies and institutions in the Great Lakes Basin concerned with pollution from land uses and identify their functional responsibilities for remedial measures. There is a need to know who is doing what.

2. That dependence on 208 planning in the Great Lakes Basin as a basis for further remedial action be conditional on a review of individual plans.

These recommendations speak directly to estimates in the paper on agriculture predicting loss of 7.5 million acres of farmland in the basin by the year 2020. The conclusion that productivity will increase despite this loss because of intensive cultivation and an increase of pesticide and fertilizer use is a simplistic and questionable extrapolation of trends in the last quarter century. The statement ignores other alternate futures conditioned by energy and fertilizer shortages, climatic change, loss of major farm acreages elsewhere due to drought and salinization, a switch from chemical farming due to soil deterioration, and even biological limits to the yield a plant may produce. Remedial measures will be supported by actions to ban conversion of farmland and reduce necessity for drainage and intensive cropping. Further, we recommend:

1. That stewardship to preserve and maintain prime agricultural land be encouraged by and in government, by property owners.

2. That research priorities be reordered away from increased agricultural production toward that which will maintain long-range agricultural capacity.

There have been two considerations in programs to limit loss of agricultural soils: (1) the maintenance of soil productivity for this and future generations, and (2) the limitation of off site drainages from soil and chemical movement. The SCS has established soil loss tolerances of up to 5 tons per acre per year. While this standard is supposedly adequate to maintain production "indefinitely", it may not be stringent enough to prevent off site damages. Erosion can be controlled by three general groups of practices including new cropping and tillage combinations, alternate land treatment practices and structures to trap sediment and stabilize stream channels.

Not only modification of agricultural practices but modification of fertilizer application is an option. Depending on the nature of the soil and the land, farming efficiency and farm income do not necessarily suffer from alternatives to chemical fertilizer. There are indications that crops generally use less than 50% of nitrogen applied and that applications are often applied at rates beyond crop needs. Yet, where procedures are not used to restore organic nitrogen to soil, soil porosity is lost, nutrient uptake is reduced and the usage of nitrogen fertilizer can maintain production only at increasing cost, fiscally and environmentally. While research is being done on the economics of alternatives to chemical farming, more needs to be done to demonstrate effectiveness. The relationship of agricultural specialization, commercial credit and farm vulnerability to fluctuations in a larger economy needs examination.

While management practices are effective and available, many farmers remain unreceptive to erosion control practices, agencies and programs. Soil erosion is often viewed as a personal problem to be dealt with only as required to protect an investment in land, and considerable ignorance about available programs is evidenced. Some combination of increased knowledge, incentives and leadership seems essential. The panel therefore recommends that governments:

1. Encourage use of agricultural land within its capabilities.

2. Establish standards of best management practices and goals, to be met through voluntary action if possible, and enforcement, if necessary. Both education and incentives should be provided.

and states its support for the philosophy of H.B. 513 which deals with the control of non-point sources of pollution (See appendix).

Any farm management system that promotes a reduction in surface runoff and an increase in infiltration, effectively is controlling water pollution. The addition of organic matter improves soil structure and increases infiltration. If prevented from running off the soil surface, phosphates will be held in the soil and extremely small quantities will leave in the subsurface flow. The correspondingly higher sub-surface drainage can increase nitrate nitrogen leaching which can be countered by avoiding fertilizer application in months when crop uptake is low and water seepage is high and by restricting quantity applied to just meet requirements.

A materials shortage problem may also affect phosphates. It has been estimated that the economic supply of phosphate rock will last only about sixty years at the current increasing rate of mining. Phosphate compounds are for all practical purposes non-cyclical which means that one of the bases of intensive agriculture is disappearing with frightening rapidity. Therefore, the panel recommends:

1. That the best control for phosphate pollution would be to limit the amount of soil erosion through better management practices.

2. More widespread utilization of soil testing as a management tool.

3. Additional studies on the transport of nutrients.

Although it is generally accepted that the non-persistent pesticides in use in agriculture today represent no threat, there are disquieting indications that this may not be totally assured. University of Wisconsin researchers have found residues of parathion and several other widely used insecticides bound to soil particles in such a way as to avoid detection by conventional means. While the insecticidal activity is reduced, little is known of the overall biological importance or the circumstances under which they could be released from the bound condition. DBCP is another soil fumigant that was believed to break down in the soil after application, but Canadian researchers have found traces in root crops. DBCP is a potential carcinogen.

There are many counterproductive side effects of pesticide usage and the increasing concern for health, environmental energy and financial cost is leading to alternatives to chemicals. These are a wide assortment of natural pest-control tactics, used in various combinations, known as IPM (integrated pest management). USDA has made some effort to promote IPM through the Extension Service but the key to widespread adoption lies in routine recommendation and support by regular channels of USDA.

There is a potential contamination of the lakes by unregulated storage of surplus pesticides, by disposal of manufacturing wastes from pesticide manufacturers and formulators and by "empty" pesticide containers from professional applicators and agricultural users. The use of landfills and deep well injection without prior detoxification is a significant hazard. Although persistent pesticides are no longer used, the hazard from residues in soils from earlier application is not known. While contamination of surface waters has some chance of being discovered in the existing pollution control framework, ground water supplies are typically not integrated into watershed or other management systems. Fragmentation of responsibility is typical and, since smaller water supplies are not monitored regularly, the potential for discovery of severe pollution is low.

The following are the panel's recommendations relative to pesticides:

1. Better management practices should be used on farms when applying pesticides.

2. Soils should be monitored for residual pesticides.

3. Provide more state authority to monitor and control the storage and disposal of hazardous wastes is required, as well as enforcement capability.

4. Landfills must be stringently regulated and that existing and closed landfills must be monitored for the escape of hazardous materials.

5. Soils that have been subject to persistent pesticides should be monitored for residual contamination and relationship to crop uptake.

6. Ground water supplies should be subject to the water control organizations and criteria that control surface water and that monitoring for hazardous contaminants should be required.

TRANSPORTATION

Discussion indicated that panelists are concerned about pollution of Lake Erie that comes from our transportation system. Sediment runoff from new highway construction, improperly vegetated slopes and from inadequately maintained drainage channels and ditches provide sources of non-point pollution which can be remedied. On highly urbanized areas of the basin such as N.E. Ohio, panelists believe that substantial amounts of petrochemicals, lead and chlorides can be traced to highway runoff. Ohio does not presently require covered storage bins or containment dikes around chloride stockpiles. Chlorides are used extensively during the winter storm season and are a source of substantial loadings to the watershed.

Suggested Remedial Measures

1. Encourage R & D and essential programs which develop potential for widespread use of permeable surfaces for parking lots.

2. Federal and state regulations to require control of construction runoff and maintenance of drainageways should be promulgated and implemented.

3. Better methods for channelling freeway drainage into the stormwater runoff system so that polluted runoff can be directed to settling ponds, STP's etc.

4. Require that chloride stockpiles be covered and that runoff from stockpiles be contained.

5. Encourage R & D to find less polluting alternatives than chloride for alleviating winter ice hazards on Ohio roadways.

6. Require that all rights-of-way be maintained in such a way as to discourage sediment runoff.

ADDITIONAL QUESTIONS THAT PANELS MAY CONSIDER FOR FINAL REPORT

1. Identify the issues that may be difficult to overcome in formulating a solution or its implementation. Specify the groups associated with various positions surrounding each issue.

2. Are there some state goals (regional goals, local goals) that could be met through this international effort?

3. What are possible roadblocks to consensus on a remedial package at the state level?

4. What sanctions could be applied if a Great Lakes state fails to do its share to remedy the problem?

5. One official of a local government in a mid-Atlantic state poses these questions about implementation:

   1) Does the preferred implementation vehicle exist now, or must it be created?
   2) Can another approach be taken?
   3) Is the preferred vehicle politically acceptable?
   4) If enabling legislation is needed, can it be enacted?
   5) Will the vehicle be acceptable to the public?

6. What financing package could be put together? Who pays for what? When is it paid? How is it paid? What is the economic effect of this? The environmental effect?

7. What funding sources are available for further Great Lakes water quality planning: by States? local government? What funding sources are available for implementing remedial measures?

8. Communications with all concerned parties will be essential if a problem is to be solved. What do you suggest regarding communications about the problem and possible solutions?

PANEL RESPONSES TO ADDITIONAL QUESTIONS

1. Issues that may be difficult to overcome in formulating a solution or its implementation:

   a. The inertia or reluctance of state, municipal and county government to exert any leadership to solve water pollution problems.

   b. The difficulty of educating officials responsible for program implementation and of obtaining commitment from the.

c. Groups to reckon with include the Ohio EPA, the Ohio Municipal League, the Association of Township Trustees, the County Commissioners Association, the Ohio Planning Conference, the regional planning and development agencies (NARC), the county sanitary engineers, Ohio Department of Economics and Community Development, Ohio Department of Natural Resources, federal Environmental Protection Agency and Office of Management and Budget, Ohio Department of Agriculture, Soil Conservation Service, Cooperative Extension Service and Ohio Farm Bureau.

d. The disillusionment of public agencies and the knowledgeable public with 208 planning programs.

2. State and regional goals that could be met through this international effort:

   a. Improved air and water quality (Clean Air Act and 92-500 compliance).

   b. Achievement of sedimentation control through improved agricultural and urban sediment control programs.

   c. Improved land use practices.

   d. Reduction in flooding and improved water retention qualities in land areas.

   e. Better land use decision making mechanisms.

   f. Reduction in amount of storm water runoff from urban areas. This may alleviate the need for separate storm sewers and additional plant capacity.

   g. An educated population with respect to needs and alternatives for water pollution control.

   h. More equitable cost sharing for pollution control.

   i. Water conservation.

3. Possible roadblocks to consensus on a remedial package at the state level include the following:

   a. Lack of knowledge of problems and alternatives for remedial solutions on the part of the Ohio General Assembly and various affected administrative departments.

   b. Historic reluctance of the State of Ohio to provide coordinated leadership to solve environmental pollution problems.

   c. Conflicting goals between state agencies.

   d. Divided responsibility for wastewater management between OEPA, Ohio Department of Health and PUCO and for water supply between ODNR, OEPA, Ohio Department of Health and PUCO.

   e. Fear of certain private interests (by state elected and appointed officials).

   f. Lack of access to adequate funding from state general funds.

   g. Reluctance to provide necessary institutional changes.

4. Sanctions which could be applied if a Great Lakes state fails to do its share to remedy pollution problems***.

   a. Federal takeover of state pollution control programs.

   b. Reduce or freeze economic development and Title XX funds, housing development monies until states evidence compliance.

   c. No new development should be permitted by EPA or CoE until states implement remedial and prevention programs.

   d. Have the CoE take its dredges out of rivers and harbors and "go home" until the states and local governments in question prove effective remedial action to reduce sedimentation.

   e. Federal action to require states to earmark revenue sharing funds to underwrite costs of remedial actions.

   f. Carrot-and-stick cost sharing.

5. Implementation vehicles are deficient. Legislation has been introduced (H.B. 513) or will be introduced shortly (Land Use Review Committee Legislation) which would provide basic tools in addition to existing federal environmental law and regulation. Additional legislation is needed to designate a single state agency as having primary responsibility for both water supply and wastewater management for both urban and individual systems.

   The legislation will be enacted and will be acceptable to the public if:

   a. There is an adequate and fair education program to inform policy makers and public of needs and rationale for such.

   b. There is cost sharing by public and private sector.

   c. The emphasis is on containment or reduction at the source.

   d. We can show evidence of existing laws equitably enforced.

*** All of the above assume (naively) that the federal government will clean its own house and require all of its agencies and programs to initiate and implement appropriate remedial actions.

6. Financing for non-point pollution control will have to be led by federal incentive. This would serve to establish the same basic mechanisms for all the Great Lakes states. Much financing is already available under existing programs. It just needs to be identified.

   It is ineffective and unrealistic to talk about a "financing package" - we are not underwriting a simple marketing campaign. Funding comes from many sources for many purposes and perhaps the most efficient thing to do is require the states to show how they intend to fund implementation of remedial programs (that should include discussion of private sector incentives, cost-sharing and outright financing). But first there needs to be education: What can be done and why should it be done?

   Many of the remedial measures discussed are non-structural or if structural (engineering) could be covered under existing programs. Non-structural solutions in general are less costly.

   Basic criteria should require the following:

   a. Uniform enforcement of existing environmental laws - no compromising of goals.

   b. The source bears primary responsibility for financing prevention or remedial actions (whether a farmer, a corporation or municipality).

   c. Cost-sharing or long term low-interest loans should be a major mechanism for bringing farmers and individuals into compliance.

   d. Revamping of taxing structure for agricultural land and business is needed in Ohio.

7. It was very difficult to give any meaningful answers to this question. PLUARG did not provide informational materials and we did not have time to research!

8. Communications regarding cause of pollution to Great Lakes Basin from land use actions, remedial actions proposed or available and implementation actions are essential. The level of ignorance, in both public and private sectors in professionals and citizens alike is very high. The governments need to commit themselves to intensive educational programs to:

   a. Educate general public via public radio and T.V., travelling slide shows, speakers' bureaus, etc.

   b. Educate public officials and agency staff charged with remedial action responsibility to:

      i) inform them of needs and alternatives
      ii) train them to plan for and implement remedial actions

   The biggest task may be to educate the water resource planners themselves. 208 agencies may be among the largest impediments to improving water quality.

ADDITIONAL COMMENTS

The panel did not have time, or in some cases adequate information, to consider in any depth the following sources of non-point pollution: Forestry, Shoreline Landfilling, Shoreline and Riverbank Erosion, Extractive Areas, Recreation, Deepwell Disposal, Solid Waste and Sewage and Sludge Disposal, and Atmospheric Inputs. However, we do wish to note the following:

FORESTRY AND RECREATIONAL USE

We do not consider forestry or recreational use to be providing any significant amount of inputs to the Lake Erie Basin. For the rest of the Great Lakes Basin we note that significant sediment pollution can occur from forested areas.

SHORELINE LANDFILLING

1. We note that the Lake Erie shoreline has experienced extensive filling of wetland and would recommend a ban on additional filling. Pollution will continue to result from leaching or fly ash fill added by Cleveland Electric Illuminating Company and other utilities.
2. Additional development, other than harbor development, is inappropriate for the Lake Erie shoreline, and filling, of wetlands in particular, should be prohibited by state law.
3. Location of dredge spoils should be carefully sited. Landfilling for purposes of additional residential or commercial development should be prohibited.
4. If polluted dredge spoil landfills are created, resulting land should remain in the public domain for public use.

SHORELINE AND RIVERBANK EROSION

Shoreline Erosion

1. Although substantial amounts of sediment enter Lake Erie from shoreline erosion, the panel could not find any equitable and effective remedial measures to recommend. Structural solutions have been largely ineffective and in some cases have caused more problems than they have solved.
2. Care should be taken in locating intake lines and other in-lake structures to avoid accelerating shoreline erosion.
3. New residential development on the shoreline should be prohibited.

4. A long range public acquisition program should be considered for the purpose of gradually transferring to public control: residential and commercial property along the shoreline.

5. The natural processes of erosion be allowed to operate - (no more shoreline landfill, etc.).

Riverbank Erosion

1. Floodways should be protected from inappropriate uses and from development by the enactment of legislation.

2. Encourage streambank maintenance programs such as grassed and vegetated banks, proper road grading and maintenances of bridges. Prohibit building.

3. Federal government should re-enact legislation to provide for sanctions in Flood Insurance Act.

EXTRACTIVE ACTIVITIES (MINING)

Some concern was expressed about chloride contamination from salt mines along the Lake Erie shoreline. Strong opposition was registered to using those salt mines to dispose of radioactive wastes as is now being proposed. There was also concern relative to the Ohio gas and oil wells proposed for Lake Erie.

UNITED STATES PUBLIC PARTICIPATION PANEL MEMBERS AND AFFILIATIONS

OHIO

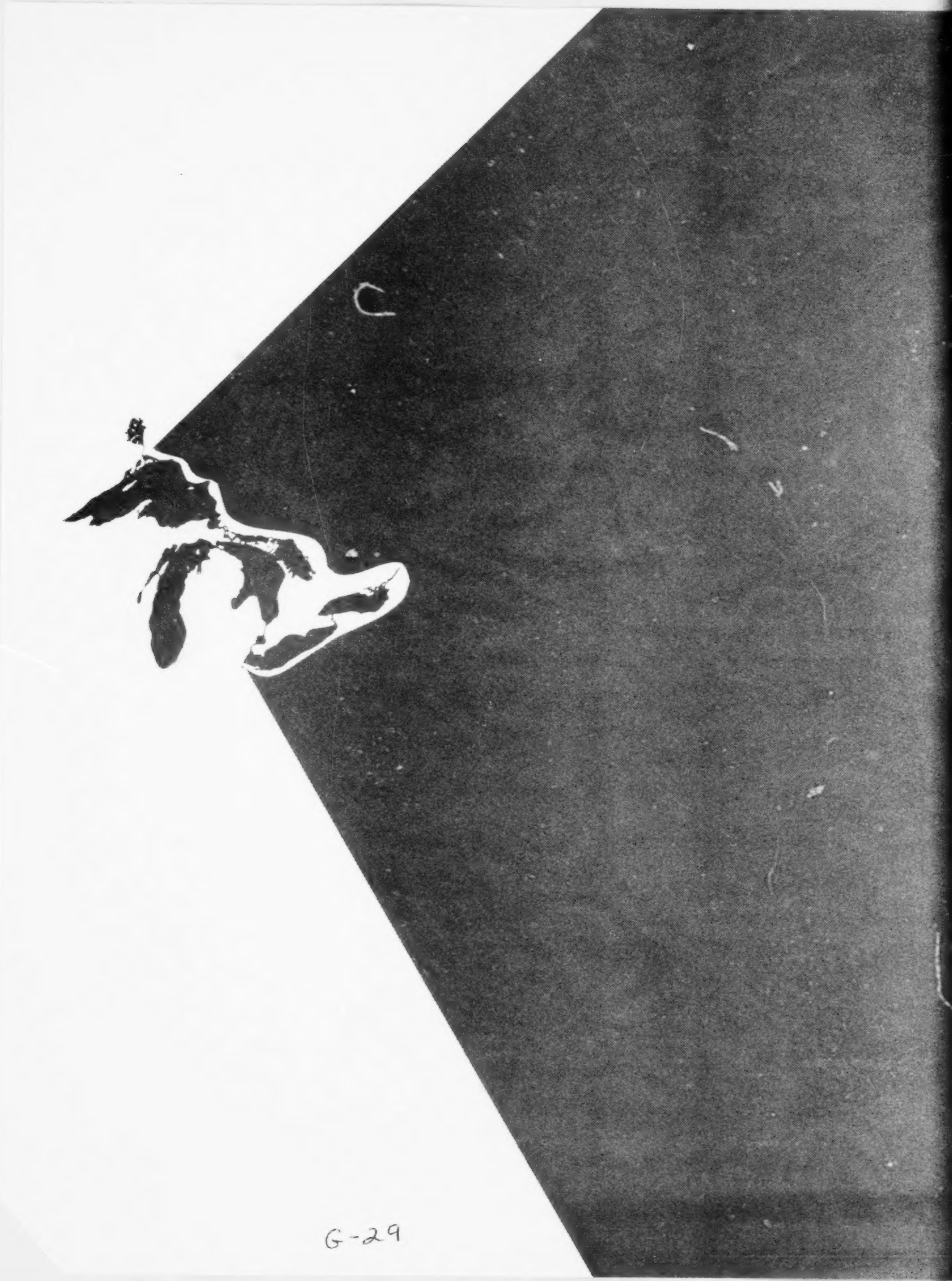
NAME	AFFILIATION
Michael Arcaro	Pittsburgh & Conneaut Dock Co.
Calvin Kiracofe	Ohio Federation of SWCD
Ray Robinson	Planner, City of Stow
William Jackson	Professor, Bowling Green University
Thomas Gilles (alternate for Robert Morrison)	Lake County Engineer
Dale Stacey (alternate for Helen Rofkar)	County Commissioner - Seneca County alternate for Ottawa County Commissioner
Robert Roush	Chairman for TMACOG
George Kunkle (alternate for Mary McCormack)	Environmental Engineer, alternate for League of Women Voters member
Margaret Cummings (alternate for Mary McCormack)	League of Women Voters - Medina County
Larry Bowmann	Ohio Farm Bureau Federation
Mimi Becker	Panel Chairman, Great Lakes Tomorrow, Ohio Environmental Council
Frederick Deering	State Representative
Allen Muhic	Engineering Consultant, Howard Needles Tammen & Bergendoff
Frank Goodell	Farmer
Barbara Wiese	SWCD Supervisor
Dorothy Portz	Mayor, City of Solon
Jerome Stano	State Senator
Manny Barenholtz	(resigned) Homebuilder
David Cashell	Lewis Research Center

NAME	AFFILIATION
Richard Novak	Department of Community Development - City of Lorrain
Donald R. Urban	Resource Conservationist, USDA/SCS
James Cowden	Center for Urban Regionalism, Kent State University
John McWilliam	Toledo-Lucas County Port Authority
Steve Nacht	Water Quality Control Laboratory

LIST OF APPENDICES

1. Notes of first, second and third panel meetings.
2. GUIDE: A Guide For Land Use Legislation, The Ohio Land Use Review Committee
3. Proposed Agricultural Pollution Abatement Standards and Regulations, Rules of Procedure and Operation, and Cost Share Program
4. Proposed Ohio Urban Soil Sediment Pollution Abatement Standards and Regulations
5. H.B. No. 513
6. Agricultural Pollution and Urban Sediment Pollution Abatement Bill
7. Summary - Ohio Laws Affecting Pollution From Land Use Activities
8. Ohio Framework for Non-Point Source Control
9. Institutional Constraints - James W. Cowden
10. Comments on PLUARG Background Papers - William B. Jackson
11. Comments on PLUARG Background Papers - David Cashell
12. Comments on PLUARG Background Papers - Barbara Wiese
13. Unsewered Waste Disposal - Robert Roush and Donald R. Urban
14. Comments on Agricultural Sediment - Calvin Kiracofe
15. Agricultural Chemicals as They Relate to Non-Point Source Pollution - Frank H. Goodell
16. Articles entitled "Treatment System is Innovative for Coal Storage Facility" and "Better Land Use Planning is Well Worth Trying For".
17. a) HPANWO - Policy Statement on Home and Semi-Public Sewage Disposal
    b) HPANOW - Land Use Policy Statement
    c) HPANOW - Testimony at the Public Hearing on Revisions to the Statewide Home Sewage Regulation
    d) ODH - Home Sewage Disposal Rules - 1977 (Revised 1972 Regulations)

    e) ODH - Proposed Statewide Law on Home and Semi-Public Sewage - 1977



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REPORT OF THE PENNSYLVANIA PANEL

January, 1978

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OVERVIEW

The purpose of these papers is to present the findings and opinions of the IJC's, PLUARG - Pennsylvania Public Consultation Panel on non-point pollution of the Great Lakes.

The panel first determined the sources of non-point pollution that conceivably could be prevalent along the Pennsylvania shoreline, and, the relationship of these sources to the quality of the Great Lakes. They did then select the five sources of greatest impact, or concern, and set about investigating, studying and drafting reports which are attached hereto and are a part of this overview with their specific conclusions and recommendations.

The panel identified its aspirations for the Great Lakes which are as follows:

1. Continued source of drinking water
2. Recreation - swimming, boating
3. Fishing - commercial, sport
4. Transportation - thoroughfare for raw materials and finished goods
5. Climate regulator
6. Industrial coolant
7. Tourist attraction
8. Maintenance of land-water balance
9. Heat source
10. Food production - aquatic life to sustain man, and land animals
11. Drainage system
12. Wetlands - to maintain wildlife
13. Commercial - industrial economic growth

The panel's aspirations are not numbered as to their degree of importance for each is as important as the other and one is dependent upon the other.

The panel acknowledges that the aspirations it holds for the future of the Great Lakes are dependent upon the controlling of point and non-point pollution. That the Great Lakes are North America's greatest asset is an undisputed fact. Because the Great Lakes are the largest single body of fresh water in the world, it is an imperative obligation on man that he exercise all means to preserve their integrity.

CONCLUSIONS

It is this panel's purpose to support, generally, the statements and recommendations of the PLUARG organization. We do further state that we concur with their conclusions.

The subject of land use controls is one which educes the emotions of man. This panel recognizes that education of the citizenry of Canada and the United States that pollution of the Great Lakes does exist, is perhaps the most challenging task at hand. That they must realize that they are the creators of the problem, and also the solvers of the problem, should be the first order of business.

As human population grows (its growth compounds the problem of pollution), steps must be implemented to forestall furtherance of the problem and hopefully cause a regression of the present status. As man is the steward of the land he must recognize his trust and accept it with self imposition of restrictions on its usage. Failing this, the representative bodies which man has chosen to govern his affairs must assume the direction of land usage. Recognizing that with population growth demands upon land resources for housing, commerce, industry, agriculture and recreation become more acute, the panel suggests that the best-use-rule be imposed. Land with inherent qualities best suited to agriculture should be dedicated to that industry. All other lands should be dedicated to the other pursuits of man as best their location suits the intended purpose. Balance is the key word. Since ours are democratic societies, the selling of this principle (which is contrary to the "home is Castle" dogma) will not be easy; but, if we are to leave a legacy for generations to come, it must be done.

The panel feels strongly that education of the family unit through existing instruments is the most effective means for voluntary compliance. The schools, trade associations, media, churches, etc. are established, on-going outlets for forwarding information to the people. The financial burden for forumlation and implementation of programs must be borne by the two nations federally. Such programs should be tailored to each locale. The two federal governments must establish the objectives and the means to be used to enforce the rules of procedures. All of the above activity is to be within existing bureaus of federal, state and local governments. It is our belief that the already cumbersome bureaucracy should not be added to further.

To assist the two nations it is further recommended that land use planning boards be established in each of the regions. These boards should be comprised of equal representation from the socio-economic-political community. Each of these boards should have representation on a Great Lakes master board to foment uniform principles and practices. Membership on boards should be voluntary without compensation. Expenses of such boards should be covered by federal grants.

RECOMMENDATIONS

1. Education - To educate the farm community and the land developer in the best methods which will conserve the land and curtail pollutants on the land from entering the Great Lakes Basin. To educate the family unit as to the true existence and extent of Great Lakes pollution and how they may individually, and collectively, prevent such pollution. To engage the services of all the communications media in hard hitting promotional campaigns. To employ the services of trade associations, churches, schools (both elementary and secondary) and community and civic associations to carry the message to the people.

2. Funding - As the problem crosses state and international lines, funding should be on the federal level.

3. Laws and Regulations - Existing laws and regulations should be used wherever possible. If amending such laws makes for a more practical approach to the problem, then such amendments should be made. It should be the law and regulation makers' paramount responsibility to be ever mindful of striking a balance between the idealistic and the practical. The harmonious coexistence of housing, agriculture, industry, commerce, recreation and wildlife sanctuary must be achieved without injury to any one element for the benefit of the other. There must be compromise.

4. Compliance - Compliance with rules and laws must, for the most part, be voluntary. Should flagrant violations occur, then rigid enforcement should be available.

5. Land Use Planning - Planning should be on a regional basis by boards which are comprised of representatives from the socio-economic-political community who are aware of local conditions. These boards should be represented on a Great Lakes planning board which would evolve uniform principles and practices.

6. PLUARG Public Consultation Panels - The panels should be kept intact to review from time to time progress which is being made and to study and make recommendations relevant to future problems.

SUB-PANEL REPORT ON WASTE DISPOSAL

Waste disposal is a problem of local concern and involvement of individual citizens and corporate bodies which extends into local, state, national and international regulations. There is some question whether waste disposal is a very significant non-point source of contamination of the Great Lakes.

Waste disposal calls for intelligent political action, professionally trained public officials for planning, and an informed and cooperative citizenry for action.

Intelligent action demands that every effort be made to reduce waste produced at its source, to encourage recovery and recycling, and to cooperate with producers of waste and manufacturers of commercial products which may enter the waste stream so that these wastes and materials are made more readily recoverable, reusable, or recyclable.

Recommendations for non-point waste disposal must involve two phases: immediate procedures and long range action.

In this era of human engineering, human nature is one of the forces of nature which must be considered by the engineers with as much detail and care as any physical or chemical force. Education of all will be essential for the future.

Sanitary landfills may cause the loss of quality in local groundwater in terms of nitrates and in Great Lakes water in terms of persistent organochlorine compounds. Immediate action calls for regulation and research. Long range plans demand education of individual households, businesses, and corporations so that the problem can be tackled at the point of production. A chemurgical approach must eventually be initiated and enforced to attain the objective of recovery, reuse, and recycling. The energy production and the energy insulation capabilities of waste products must be applied to future use.

The use of sewage sludges spread on the land may cause small losses of pollutants to the lakes but may eventually affect the long term productivity of the farms.

Garbage and all wastes must be considered resources for future use.

Submitted by Waste Disposal Sub-Panel Member: Dr. Joseph Zipper

SUB-PANEL REPORT ON URBAN RUNOFF

This subject specifically addresses itself to storm water management within developed areas, or areas to be developed, of residential, commercial and industrial habitation. It is the transportation of pollutants from the urbanized areas into the basin in question by the force of storm waters that is of concern; carry-off by other forces is so minimal as to not warrant consideration.

The drafters of this sub-panel report believe that the following principles must prevail in resolving the problem:

1. That the authorities of the lowest order in the political subdivision structure in which the problem prevails will make the final determination of the solution.

2. That the county, state and federal authorities make available to the local authorities such technical and legal expertise which is within their province to provide from existing staffs.

3. That any and all solution decision must be made with the advice and consent of any other political subdivision which lies between the subdivision in question and the final depository basin involved.

4. Because the solution can affect various and several states, funding for research and development and solution costs should be borne by federal agencies.

In determining the solutions to urban runoff, drainage laws, which date back to ancient times, must be given every consideration. The "Common Enemy Rule" and the "Civil Law Rule" have been reduced by the courts to focus on "Reasonable Use" as the dominant factor in rendering decisions concerning drainage. Under the "Common Enemy Rule" the lower land owner may take any measures necessary to keep water off his land, even to the point of turning the water back onto the upper land. The upper land owner can similarly protect his property from the "Enemy" by diverting water around his property causing greater quantities at higher velocities to flow onto his neighbor's land. In its pure form it would be a might-makes-right situation. The "Civil Law Rule" states that the upper land owner has an easement over the lower land for the natural drainage of his land. "Natural" meaning the same quantity and velocity as drained from the upper land in its undeveloped state. In its pure form, this rule would substantially restrict development of the upper land. To resolve the differences of these two rules the courts have turned to the "Reasonable Use Rule".

A "Storm Water Runoff System" is composed of both natural and manmade elements. These elements consist of components which contain, convey, absorb, store and otherwise use storm water rather than dispose of it. In the past designers have failed to capitalize upon the natural element and have at times ignored it when a constructed element was installed. Such practices were wanton in their expenditures of funds for ill-conceived and inadequate objectives. The ill effects of these systems have been compounded over the decades by the growth of urban areas. With the design characteristics that caused these problems still in effect, further development of urbanization will continue to compound the problem.

The design of residential storm water systems can utilize various methodologies to arrive at solutions or alternatives for the drainage plans. Differences in runoff management philosophies and in environmental conditions should be carefully evaluated in selecting methodologies to be used. The scale of development and the size and physical characteristics of the drainage area affect selection of methods, as do climatic characteristics. While certain methods may be desirable for assessing small sites with simple drainage patterns, they may be inappropriate for larger sites with more complex patterns. Conversely, the methods available for assessing large scale or basin-wide storm water systems may be too complex, costly and/or inefficient to be useful for smaller sites, and often fail to consider important micro-scale details and alternatives. No one method or solution is possible for all areas.

Future problems can be minimized or avoided if all political jurisdictions within a drainage basin collaborate to define and implement optimum analytical methodologies, standards and regulations pertaining to drainage systems and land development.

1. Storage...When provision of storage is begin considered, the designer should verify that attenuation of the ground runoff peak will not aggravate any potential downstream peaking conditions. Storage should not be created by happenstance or strictly in response to aesthetics. Storage must be rationally planned to accomplish its intended functions.

2. Open Channels...and swales should harmonize with the natural features of the site. They should be designed so as to provide for their continuing usage and not become depositories for debris. They should relate closely to the individual lots that they abut.

3. Streets and Curbs...Residential streets are of five classes - place, lane, subcollector, collector and arterial. Each of these five classes determines the amount of paved area and the necessity of curbing to accomplish its functional intent. The necessity for curbing on the first three classes is virtually non-existent. The last class, arterial, precludes the necessity for curbing and constructed storm water runoff. The guiding principle that "paved areas generally should be minimized, insofar as practical, to increase permeable soil area to allow for absorbtion rather than runoff" should be adhered to.

4. Enclosed Systems...The use of enclosed components should be minimized to the extent consistent with

    a. The ability of existing natural systems to accommodate storm runoff and,

    b. The degree to which the local public will accept and act reasonably toward open channels.

Those areas having the highest runoff coefficients are the downtown business districts, heavy and light industrial areas followed by attached multi-unit residential developments, apartments and neighborhood business districts followed by multi-unit detached residences, single family residences. The lowest order of runoff coefficients include parks, cemeteries, unimproved areas and railroad yards. Of the various surface characteristics, runoff coefficients are greatest for asphalt - concrete - brick pavement, and roofs. Lawns with heavy soil have a greater coefficient than lawns with sandy soil.

The ability to perform, and the cost of remedial measures for those areas which are now urbanized is beyond reasonable bounds. Therefore, it is felt that PLUARG, or any other agency able to suggest or mandate guidelines, should address itself to the urbanization of new areas and the redevelopment of existing urban areas. Such suggestions and mandates should follow that which has here been set forth in broad terms. If non-point pollution from urban runoff is to be curbed, such suggestions and mandates must, of necessity, be forthcoming without undue delay.

Submitted by Urban Runoff Sub-Panel Members: Mr. Gerald Salsbury
Mr. Homer P. Herman

SUB-PANEL REPORT ON AGRICULTURAL RUNOFF

Agriculture and its related businesses are a very important part of the economic community in this Great Lakes Watershed. The pollution problems associated with agriculture which relate to the amount of pollutants entering Lake Erie must be viewed with care so that agriculture and agri-business remain economically viable.

Agricultural activities in Erie County can be classified as follows:

1. Truck farming: vegetables, cabbage, tomatoes, etc.

2. Orchards: apple, peach, cherries, etc.

3. Vineyards

4. Row crops: corn, soybeans, sweet corn, small grains, etc.

5. Animal husbandry: dairy and beef cows, beef feedlots, etc.

Each type has inherent pollution problems. The committee proposes that most of the pollutants enter Lake Erie during peak water flow periods such as rain storms and rapid spring thaws. Therefore remedial measures which would reduce this amount should be of primary concern.

These pollutants can be considered as nutrient loading of streams and tributary waterways, sedimentary erosion, and toxic chemicals. The committee considered the following as nutrient loading conditions:

1. Topical application of commercial fertilizers (surface).

2. Surface application of manure especially on snow.

3. Normal animal excrement in streams. (This problem would occur only when animal density reaches a critical level as in an outdoor feedlot).

4. Subsurface injections of manures and commercial fertilizers where soils are extremely porous and near the lake.

5. Rubbish piles and dumps near or on streams, including pesticide containers improperly handled.

The Committee considered the following as erosion problems:

6. Stream bank and waterway erosion.

7. Tilled fields: row crop and small grain farming.

8. Field access roads.

9. Barnyards heavily trafficked by cattle.

10. Rural roads (dirt and gravel) and their ditches and banks.

The committee considered the following as toxic chemicals which may enter the lake during peak water periods:

11. Herbicides, insecticides, and fungicides (pesticides).

REMEDIAL MEASURES

The committee considered the following remedial measures for each of the aforementioned potential problems. The remedial measures will be discussed in the same order as the problems.

1. Reduce excessive phosphate applications, fertilize according to soil tests, incorporate fertilizers if the land will be tilled. The committee does not feel that surface application on hay meadows and pastures constitutes a severe problem. Reduce the amount of phosphate soaps and detergents currently used in the washing of equipment as dairy equipment, vineyard equipment, etc.

2. Plow down manure as soon as possible when spread on fields to be tilled. The committee would encourage the various agricultural agencies to increase the emphasis on storage facilities for animal wastes during the winter months. Storage facilities must meet Pennsylvania Department of Environmental Resources requirements. If more group meetings, newsletter publicity, etc. of the economic gain through storage were implemented, the committee felt that most farmers would respond.

3. Fence off streams and intermittent waterways when animal density (number of animals per acre) reaches a critical point. This would apply to large outdoor feedlots or dairy cattle exercise lots.

4. In most cases this is a desired practice as it limits surface runoff of the same material.

5. Rubbish piles and dumps should be on common sense sites and buried. Pesticide containers should be disposed of according to the label.

6., Erosion is controlled with good soil conservation practices such as
7., reduced tillage near streams, leaving a grass strip, maintaining vegetative
8., cover on stream sides, reduced tillage for row crops, strip cropping,
9., no till system for row crops, sod seeding of meadows or other practices recommended by the Soil Conservation Service. Yearly maintenance of barnyard and access roads, so that proper grade and surface are retained, would reduce runoff.

10. Rural roads require more citizen concern so that the individuals responsible for their maintenance do a complete job. Proper ditching and reseeding of banks are a must. The committee also felt that monies should be allocated to search for a substitute of road salt on highways.

11. Farmers in Pennsylvania are required to have at least a private applicator's license to use restricted use pesticides. The committee is of the opinion that pesticide use by farmers is less of a problem than pesticide use by the suburban and urban dwellers. Some type of control should be used on chemicals sold to individuals who really don't know how much to apply or when. It may come to these individuals having to hire a pest eradicator.

REMEDIAL PHILOSOPHY QUESTIONS

1. Should measures be equally administered throughout the Great Lakes Basin? (e.g,, should distance from the lake, soil type, amount of rainfall affect the implementation of remedial measures?)

   Remedial measures should be equally administered throughout the Great Lakes Basin. However, measures required should only be implemented when that measure would be effective considering the distance from the lakes, soil types, topography, rainfall amounts and other pertinent factors. Remedial measures will be ineffective unless proper long range land use policies are enacted throughout the basin at the local level. Different land uses require different remedial measures, thus it makes no sense to reduce erosion if the next year the area will be paved over for a mall.

2. Who should pay the costs for remedial programs?

   Agriculture is a national industry --its problems in a particular area can affect the entire nation. Federal funding for remedial measures seems to be the most desirable funding source. State governments could provide a percentage of the monies needed.

   Some sources are currently available to "cost-share" the implementation of remedial measures with farmers. Additional funds should be budgeted for the Agricultural Conservation Program, and the Federal 208 Water Quality Program. In addition, any new legislation which makes certain remedial measures law should contain a funding source.

3. Which level or levels of government should be responsible for the implementation of remedial programs?

   The county government should be responsible for implementing remedial measures. The conservation district should be utilized to provide for implementation. There should be more cooperation between the agencies under the Department of Agriculture and state agencies. More money is needed in existing agencies to increase their ability to solve existing problems and anticipate future ones. Solutions should not be stop-gap measures but rather should result in long term effectiveness.

4. Can measures be voluntary or is enforcement necessary?

   Voluntary implementation of remedial measures is most desirable. However, enforcement provisions must be available. Educational programs and information on funding must be provided to the farmer to assure his voluntary cooperation with remedial measures. The committee believes that when the economics of conservation farming are believed by the farmer then his voluntary compliance will be forthcoming.

5. How soon should remedial measures be implemented?

   Remedial measures should be implemented as soon as possible. Provisions should be made to require the evaluation of their effectiveness and updating of laws as required.

Most remedial measures in agriculture require individual citizen participation. If each farmer realizes that he as an individual can act faster than any government agency and proceeds to reduce the amount of agricultural runoff on his farm, then the quality of water in the Great Lakes will rise and he will have contributed his share to its betterment.

Submitted by the Agricultural Runoff Sub-Panel Members: John J. Sachar
David G. Henderson
Kenneth Bostwick
Reva Henning
Willie Ruffin

SUB-PANEL REPORT ON SHORELINE EROSION

FINDINGS AND RECOMMENDATIONS

The Erie County, Pennsylvania shoreline has suffered the impact of high water levels existing from 1973 to 1976 as have other reaches of the Great Lakes.

Bluff recession and loss of beaches as well as flooding in the low lying areas were accelerated during this time period. Data as to the extent of losses are currently being compiled by the Army Corps of Engineers, Buffalo District. An examination of hazard areas was conducted in association with the Pennsylvania Coastal Zone Management Program. Information pertaining to shoreline erosion and flooding is to be found in a publication of the Department of Environmental Resources, "Shoreline Erosion and Flooding" available from DER, P.O. Box 1467, Harrisburg, Pa.

The study examines recession rates and establishes areas of critical hazard. The following is a summary of pertinent information abstracted from that report.

> "The most critical areas are in Springfield, Millcreek and North East townships. The townships of Girard, Fairview and Harborcreek are somewhat less hazardous, but are still subject to significant damage in the next 25 years."
>
> "Average recession rates since 1938 for the entire reach is one foot per year. Actual rates vary within the reach from a few inches to several feet per year."

The contribution of sediments to the lake as a result of bluff recession is enormous. The actual amount has not been computed for most of the shoreline but estimates are available. One study, done in relation to the development of a steel mill at Conneaut, does provide a specific example.

The work was done by D'Appalonia Associates, Consulting Engineers for A.D. Little of Boston. A site geology reveals the following in regard to sediment loading:

> "(D'Appalonia) used a Kern Optical Train Stereo Plotter to map the top and toe of the bluff at eleven (11) representative locations along the 5.5 kilometers of shoreline from the Conneaut Harbor breakwaters to the east. These locations were evaluated from aerial photographs for 1938...(to) 1976. Recession rates during this 38-year period for the top of the bluff varied from about zero near the eastern breakwater to 0.56 meters per year while the toe of bluff rates varied from about zero near the eastern breakwater to 0.88 m/yr. The annual loss of material from the 5.5 kilometers was about 2500 cubic meters or 33,000 cubic yards. The average loss per unit length of shoreline was approximately $5m^3$/m/yr. or $2yd^3$/m/yr. (Personal communication with P. Knuth, 1977).

It would be easy to use this data for the entire 47 miles of Erie County shoreline, but recession rates vary according to bluff materials. In fact, recession in

Springfield Township (the steel site) is more severe than other reaches. However, the data does give perhaps the maximum that can be expected from Pennsylvania shoreline erosion.

RESPONSES TO REMEDIAL PHILOSOPHY QUESTIONS

1. Should measures be equally administered throughout the basin? (e.g. should distance from the lake, soil type, amount of rainfall, etc. affect implementation of remedial measures?)

   Considering the localized phenomena of shoreline erosion, remedial measures will necessarily take place in the coastal zone. Defined, this might include the beach, bluff, and that area behind the bluff having direct and significant impact the parameters of change in the coastal zone. While engineering capabilities exist to prevent bluff erosion, the costs associated with such efforts are prohibitive. Measures that may be taken include a wider use of lands at the top of the bluff. Avoid removal of vegetative cover, prevent drainage ways from entering a bluff face, etc. Shoreline erosion is more a land use problem than a natural force when one considers that damage is to structures and that land use alterations accelerate recession.

   These remedial measures then will be advisory and directed toward property owners on the coastal fringe. It is assumed that uses beyond the immediate fringe area will have more minimal impact.

2. Who should pay the costs for remedial programs?

   As indicated above, structures are not the answer due to increased construction costs of groins, breakwaters, etc. Rather the remedial measures will be a more careful consideration of practices. The assumption is that federal and state agencies exist that are prepared to dispense information and advice upon request. Where information is lacking about a particular problem or a particular reach, the state or federal government should pay for the costs of finding the appropriate answers upon which advice can be given.

3. Which level or levels of government should be responsible for implementing remedial programs?

   Implementation of programs should be the responsibility of the individual landowner or developer. Again the recommendation is for non-structural programs that should not be costly. If structural devices are to be used to protect public property, a cost-sharing program is indicated involving local, state and federal agencies.

4. Can measures be voluntary, or is enforcement necessary?

   The kinds of remedial measures that can be taken to prevent erosion damage as accelerated by land use are those that minimize the loss of sediment to the lake. There are a number of practices that have been recommended for preserving soil and banks in inland locations. The same practices apply to the coastal zone. Just as erosion and sedimentation control plans are required for the development of lands so too should a plan be developed for occupancy of the coastal zone. From experience it seems that some type of enforcement should be at the township or municipal level. If there is no strength of enforcement at that level, the responsibility should pass to the state.

Submitted by the Shoreline Erosion Sub-Panel Members:
Lorna Slater
Gasper Tucci
Paul Knuth
Robert Reiners
Gene Heuser

SUB-PANEL REPORT ON THERMAL POLLUTION

Thermal pollution is the disposal of excess heat to water. Normally, it is associated with industrial processes and electric power generation, and it is not generally an issue in non-point pollution. One byproduct of thermal processes, however, can escape as a non-point pollutant. This "byproduct" is pathogenic microbes that grow at temperatures between 30 - 60° C,

There are numerous examples of industrial and agricultural processes that generate temperatures in the range of 30 - 60° C. At these temperatures certain types of microbes grow. Rainfall can leach the microbes from their growing site into public waters.

Storage of coal is a typical example of the problem. Coal is normally stored in large piles completely exposed to air and water. It self-heats, sometimes to the point of combustion, and the microbes grow in the areas of the coal pile that are in the temperature range of 30 - 60° C. Rain water leaches these microbes from the pile. In modern coal storage methods, techniques are used to minimize self-heating, but it is not possible to eliminate it completely. Settling ponds are used to trap leachates from the piles, but the efficacy of settling ponds to trap microorganisms has not been tested. An educated guess, however, is that settling ponds are not an effective treatment method. Wind is also a potential source of dispersal since many of the organisms become airborne.

These microbes have been documented as growing in coal storage facilities, grain storage facilities, in many normal agricultural procedures, and in shallow water heated by sun to the right temperature range.

Species of bacteria, fungi and protozoans are involved. Many of them are not only capable of causing disease in humans, but also cause disease in domestic animals and a wide range of wild animals.

Many of these organisms have only been discovered in the past few years, so it is impossible to answer, with any certainty, many of the questions about them such as:

1. How common are they in water and air?

2. What is the incidence of infection?

3. What members of the population are susceptible?

4. What is the incidence of natural immunity?

5. What combination of physical and biological factors influence infection?

6. What is effective treatment and control?

7. Do drinking water treatment plants effectively remove these organisms?

Most microbiologists do feel that enough is known to guess that the incidence of disease from these organisms is quite high,but that they are not recognized by physicians; instead, they are erroneously diagnosed.

Enough evidence has accumulated that they multiply in cooling water discharges from nuclear power plants that the United States Environmental Protection Agency and Department of Energy are establishing research programs designed to provide more information on the organisms. However, I am not sure how much of the information gained in these programs can be validly extrapolated to non-point sources.

I have enclosed a bibliography on the organisms that we prepared for EPA. This bibliography is specific for nuclear power plants, but enough general background papers are included that it can be used by anyone wishing a general overview of disease problems associated with these organisms.

I would suggest that PLUARG recommend to the International Joint Commission the following:

1. Monitoring programs to determine how frequently the organisms occur as a non-point pollutant and from what sources.

2. Research to determine effective controls.

3. Educational programs for physicians to help them recognize these diseases.

4. A requirement that physicians report incidents of infection to the United States Public Health Service and its Canadian counterpart.

Submitted by the Thermal Pollution Sub-Panel Members: Gloria Rall
Reva Henning

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REPORT OF THE WISCONSIN PANEL

January, 1978

INTRODUCTION

The Wisconsin Public Participation panel met on three occasions in 1977. The panel was charged with identifying for PLUARG the nonpoint pollution remedial actions which would be most practical from a social, economic and environmental perspective.

During its deliberations, the Wisconsin panel identified several nonpoint source pollution concerns which it believes to contribute the greatest to the degradation of the Great Lakes. These concerns are summarized in Section II of this report. The panel also agreed upon some broad philosophical questions concerning the administration and funding of remedial programs and these conclusions are discussed in Section III. But in the main, the Wisconson PLUARG Public Participation panel believes that specific water quality goals must be established and cost effectiveness analyses must be conducted on all remedial measures before specific measures can be recommended for implementation. Section I elaborates on this finding.

SECTION I. PROCEDURAL RECOMMENDATIONS

The Wisconsin panel concluded that the request for public input as to the acceptability and/or feasibility of various remedial measures in the Great Lakes Basin has been premature. While the panel concurs that nonpoint sources of pollution pose a threat to the Great Lakes, and while members concur that these nonpoint sources have been identified and possible remedial actions have been catalogued, we do not believe that the remedial measures have been analyzed adequately to present our panel, legislators, regulators or the general public with comparative cost data which would enable a reasonable choice among the alternative remedial actions. We would recommend that the following procedures be followed before governmental regulatory agencies, other governmental units, or public citizens be asked to recommend specific remedial measures:

1. First, specific goals for water quality should be established. Since the PLUARG studies have identified with some detail what the major nonpoint source pollutants are, attempts should be made to set specific goals on various water quality parameters. As an example, it should be clearly stated that our goal by 1980 is to reduce phosphorus levels in Lake Michigan to .02 milligrams per liter or whatever is the technically sound level. To achieve such a goal, it should be indicated that a fixed number of tons of phosphorus per year must be eliminated from the lake. Similar specific goals for other pollutants should be established.

2. Once the specific goals have been established, cost effectiveness studies should be done on each possible remedial measure. This analysis should take a simple form of calculating tons of a pollutant removed per dollar spent. As an example, it might be established that cleaning streets will remove 1.2 tons of phosphorus per $1 million spent while some other remedial action might reduce only one ton of phosphorus per $1 million spent. All remedial measures should be analyzed under this same format.

3. Each remedial measure should be rated, based on its cost effectiveness. As an example, street cleaning might be listed as 1.2 tons of phosphorus removed per $1 million spent; package treatment plants 1.0 tons; exclusion of livestock from water courses .7 tons; etc.

4. A comprehensive analysis of current laws and agencies to determine their impact on the water quality goals should be conducted. Attempts should be made to determine how many pollutants would be removed from the Great Lakes if all present laws were enforced. Agency effectiveness analyses should be conducted before it is determined whether or not there is a need for additional laws and/or agencies. New legislation, if needed, must be written in such a way as to be more effective than present laws which are not achieving their desired goals. Likewise, any new agencies and programs must be designed so as to correct the ineffectiveness which is seen in some of the existing agencies and programs.

5. Public comment on the trade-offs which may become necessary to achieve the desired reduction of a specific quantity of pollutant can only be made once true costs of remedial actions are known. Public participation panels should be reconvened to review specific remedial measures based on their cost effectiveness ratings to give opinions of public acceptance. These panels could also recommend implementation timetables after total costs are known.

SECTION II. NONPOINT POLLUTION CONCERNS

The Wisconsin panel identified the following eight general concerns representing those problems which we consider to be of significance to nonpoint source pollution of the Great Lakes. No attempt was made to rate the relative importance of one problem over the others in this listing.

1. Toxic Substances --including pesticides, PCBs, road salts, and other toxic chemicals which may enter the Great Lakes from a variety of sources.

2. Urban Runoff --including parking lot and shopping center runoff, salt runoff as a result of street de-icing practices, sedimentation from road construction and unpaved parking lots, bypassing of municipal treatment plants during high storm water episodes, and general runoff from urban construction projects.

3. Agricultural Runoff --including barnyard or feed-lot runoff of animal wastes, chemical or nutrient runoff as a result of pesticide and fertilizer applications, and agricultural practices which would permit livestock to be in or near streams in a watershed or which would lead to extensive sediment runoff.

4. Loss of Natural Buffers --including the gradual disappearance of wetlands in the area bordering the Great Lakes.

5. Land Erosion --including natural erosion of Great Lakes shoreline areas, as well as land erosion brought on by man's activities in agricultural or other land use activities.

6. Waste Disposal Problems --including septic tank failures, leachate from solid waste disposal sites, the disposition of dredged materials from rivers and harbors in the Great Lakes system, and mining waste disposal.

7. Atmospheric Fallout --including a variety of concerns over improper incineration, and vehicular or other air emissions which result in heavy loadings of potentially toxic or hazardous materials to the Great Lakes.

8. People Problems --including those institutional arrangements which have failed to produce uniform water quality standards, which have created conflicting and overlapping laws and jurisdictional authorities, and which have been ineffective in the enforcement of existing regulations. The public has not been given a clear understanding of water quality goals or of the options to achieve those goals based on cost effectiveness.

SECTION III. PHILOSOPHICAL QUESTIONS

In general, the Wisconsin panel addressed itself to a series of philosophical questions concerning remedial measures to reduce nonpoint source pollution in the Great Lakes. In response to the specific questions raised, the following summarizes the general areas of consensus among panel members:

1. Should nonpoint pollution source abatement measures be equally administered throughout the Great Lakes basin?

   Nonpoint water pollution abatement procedures should be based on cost effectiveness. These procedures must be flexible and may vary from watershed to watershed. Nonpoint pollution abatement programs must be tailored to specific watersheds.

   As an example, a watershed in an urban area may have water quality standards and resulting control programs which differ from those in an agricultural watershed. These variations would be allowable as long as the overall nonpoint pollution abatement goals for the Great Lakes would be attained.

2. Who should pay the cost of remedial programs?

   The best method of financing a remedial program would be under a formula calling for 75% federal, 5% state, and 20% local funding. In order to insure progress in the absence of state or federal funds, those municipalities or individuals who proceed immediately should be guaranteed reimbursement if the remedial program is funded at a later date.

   As an example, a farmer who installs a system to control feed-lot runoff should be eligible for reimbursement of a portion of his costs if such a remedial program subsequently qualifies for federal or state funding.

3. Which level or levels of government should be responsible for implementing remedial programs?

Implementation of remedial programs should be at the county level. It is essential that minimal standards be established by the federal and/or state governments, but implementation should be on the county level.

As an example, it has been suggested that Wisconsin's Floodplain and Shoreland Zoning Program, or the Wisconsin Social Services Program, are typical of the institutional arrangements that promote most effective and efficient implementation of a given program. In the absence of action at the county level, an individual should have recourse to the state and the state should have the authority to assume responsibility for the project.

4. Can measures be voluntary or is enforcement necessary?

   To the extent possible, voluntary compliance is desirable. However, it has been our experience that strong enforcement activity is essential to insure progress. Requests for governmental grants for any project should be reviewed to insure compliance with nonpoint pollution abatement programs.

SUMMARY AND ACKNOWLEDGEMENTS

The above information summarizes the basic conclusions and recommendations of the Wisconsin Public Participation panel. The panel strongly urges that the International Joint Commission reconvene this group or similar groups following completion of the cost effectiveness studies outlined in Section I. Public participation panels would be better able at that time to prioritize the economic, social, and environmental trade-offs necessary to attack the problem of nonpoint source pollution of the Great Lakes.

The Wisconsin Public Participation panel is grateful for the assistance provided to it by staff members of the International Joint Commission, particularly Mr. Marty Clark, Ms. Mary Vassov and Ms. Pat Bonner. We also appreciated the advice and consultation from Wisconsin PLUARG member, Dr. John G. Konrad.

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LIST OF APPENDICES

1. Individual panel member comments on this report.
2. Notes of Wisconsin Public Participation panel meetings, 1, 2, and 3.